

Installation and Service Instructions

for use by heating contractor

VIESSMANN

Please file in Service Binder

Vitotronic 100, Model GC1
Digital boiler control unit



VITOTRONIC 100, GC1



Certified as a component part
of Viessmann boilers only

IMPORTANT

**Read and save these instructions
for future reference.**

Safety, Installation and Warranty Requirement

Please ensure that this manual is read and understood before commencing installation. Failure to comply with the issues listed below and details printed in this manual can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

Licensed professional heating contractor

The installation, adjustment, service, and maintenance of this equipment *must be* performed by a licensed professional heating contractor.

- *Please see section entitled "Important Regulatory and Installation Requirements."*



Advice to owner

Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually before the heating season begins.

Warranty

Information contained in this and related product documentation must be read and followed. *Failure to do so renders warranty null and void.*



Product documentation

Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

- *For a listing of applicable literature, please see section entitled "Important Regulatory and Installation Requirements."*



Safety, Installation and Warranty Requirement *(continued)*

Safety Terminology



Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death, serious injury or substantial product / property damage.



WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product / property damage.



CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product / property damage.

IMPORTANT

Helpful hints for installation, operation or maintenance which pertain to the product.

Product Information

Vitotronic 100, GC1

For installation on Viessmann
boilers only.

Applicable to the following control units:

Part No. 7134 553/7134 554/7511361, from Serial No. 7143 002 □□□□□□□□

This document describes the Vitotronic 100, GC1 as used in
a single-boiler application and a multi-boiler system with an external building
automation system.

These instructions are **not** required for the Vitotronic 100, GC1 used in multi-boiler
systems with the Vitocontrol-S, VD2/CT3/CM2.

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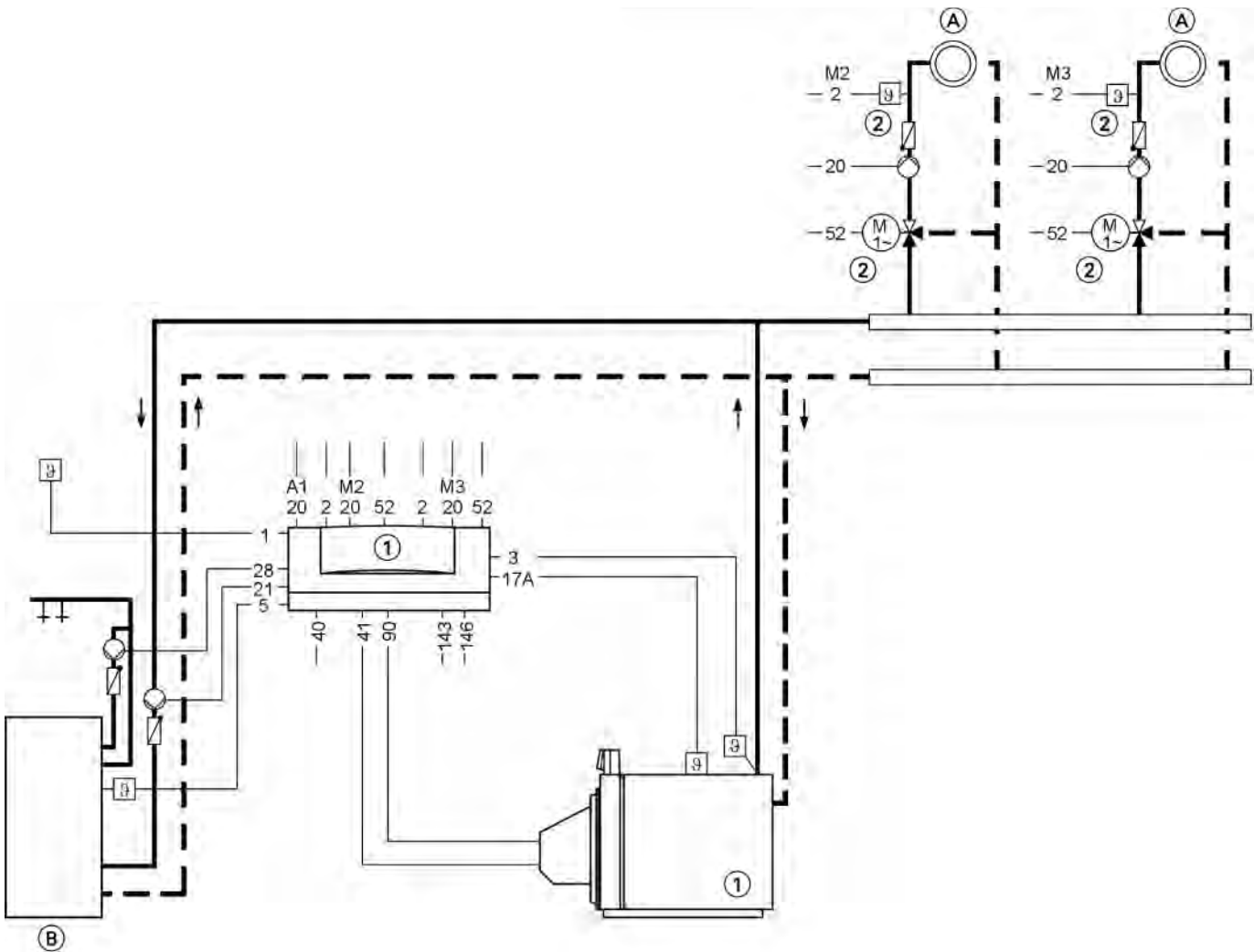
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Overview

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Circuit Diagram 1

Single-boiler system with Therm-Control and three-way mixing valve
in conjunction with Vitorond 200, VD2A



- (A) Heating circuit with mixing valves
(B) DHW tank

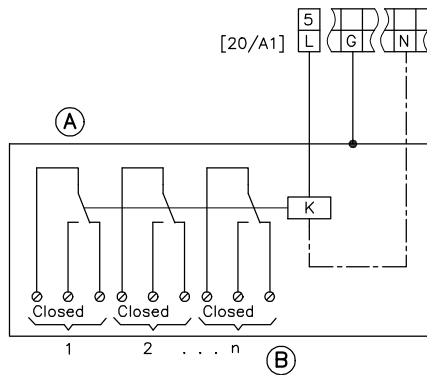
Plug

- | | | | | | |
|-------|---|--------|---|-------------|--|
| [1] | Outdoor temperature sensor (only for Vitotronic 300) | [20]M2 | Heating circuit pump, mixing valve (only for Vitotronic 300) | [40] | Power supply, 120 VAC 60 Hz |
| [2]M2 | Flow temperature sensor, mixing valve (only for the Vitotronic 300) | [20]M3 | Heating circuit pump, mixing valve (only for Vitotronic 300) | | Install the main isolator in accordance with regulations |
| [2]M3 | Flow temperature sensor, mixing valve (only for Vitotronic 300) | [20]A1 | Closing the mixing valves with external heating circuit control units | [41] | Burner (stage 1) |
| [3] | Boiler water temperature sensor | [21] | DHW primary pump | [52]M2 | Mixing valve motor (only for Vitotronic 300) |
| [5] | DHW tank temperature sensor (accessory for the Vitotronic 100) | [28] | DHW circulation pump (only for the Vitotronic 300) | [52]M3 | Mixing valve motor (only for Vitotronic 300) |
| [17]A | Therm-Control temperature sensor | | | [90] | Burner (burner stage 2 / mod.) |
| | | | | [143]/[146] | External connections |



Please refer to the control manual Vitotronic 300 GW2.

Circuit Diagram 1 (continued)



Wiring diagram

Wiring of the Therm-Control in heating systems with heating circuit control units are not connected to the boiler control unit via the LON.

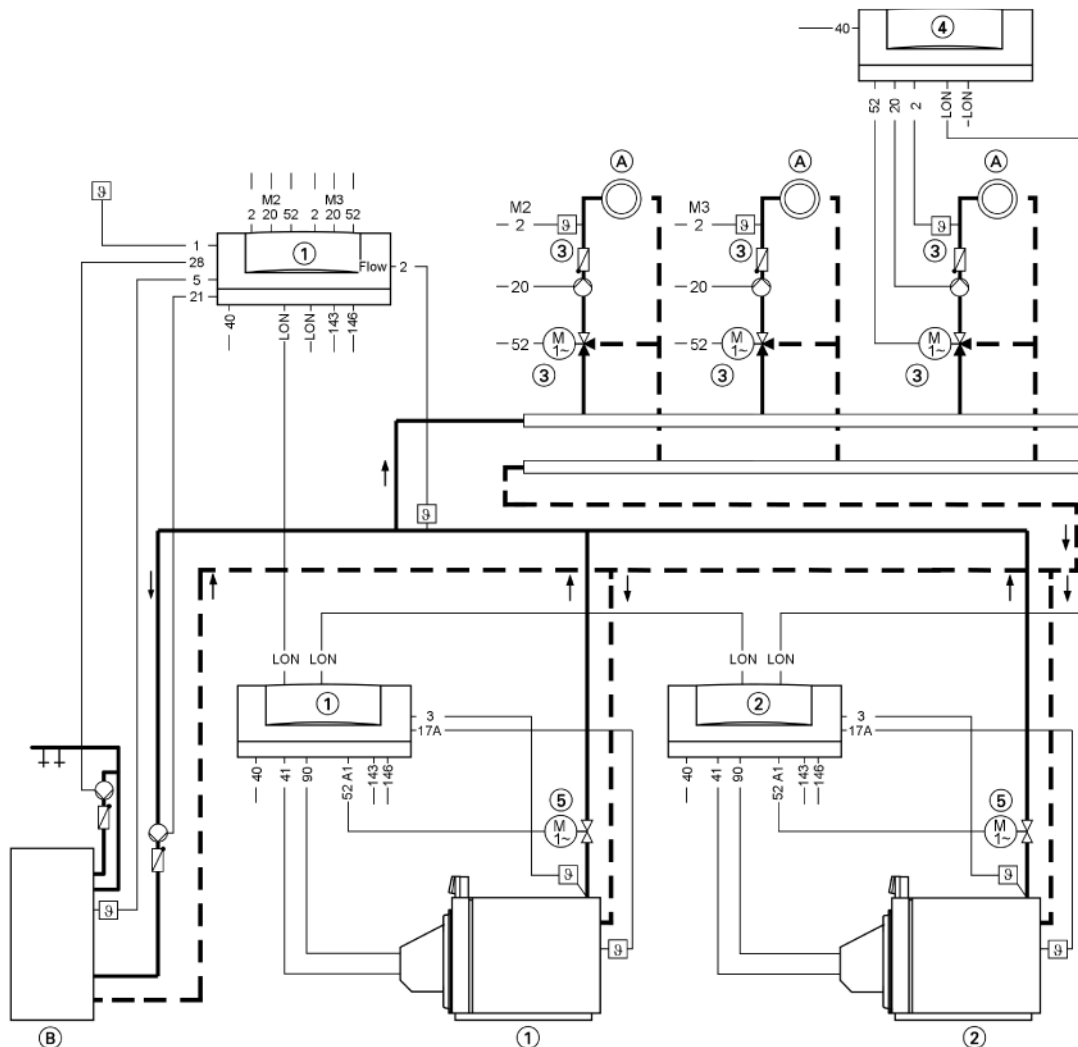
Required coding:

Change "4C" to "2" - use the plug-in connector 20 A1 to close the downstream mixing valve. Change "0D" to "1" - the Therm-Control acts on the mixing valve of the downstream heating circuits (for Vitotronic 200 and 300, delivered condition).

- 20 A1 Close mixing valves
- | | |
|-----|--|
| (A) | Contactor relay, field supplied |
| (B) | Heating circuit controls
connected downstream
Switch contact closed: signal
for "close mixing valve". |

Circuit Diagram 2

Multi-boiler system with Therm-Control and three-way mixing valve
in conjunction with Vitorond 200, VD2A



LON LON connection (available connections with terminator)

(A) Heating circuit with mixing valves

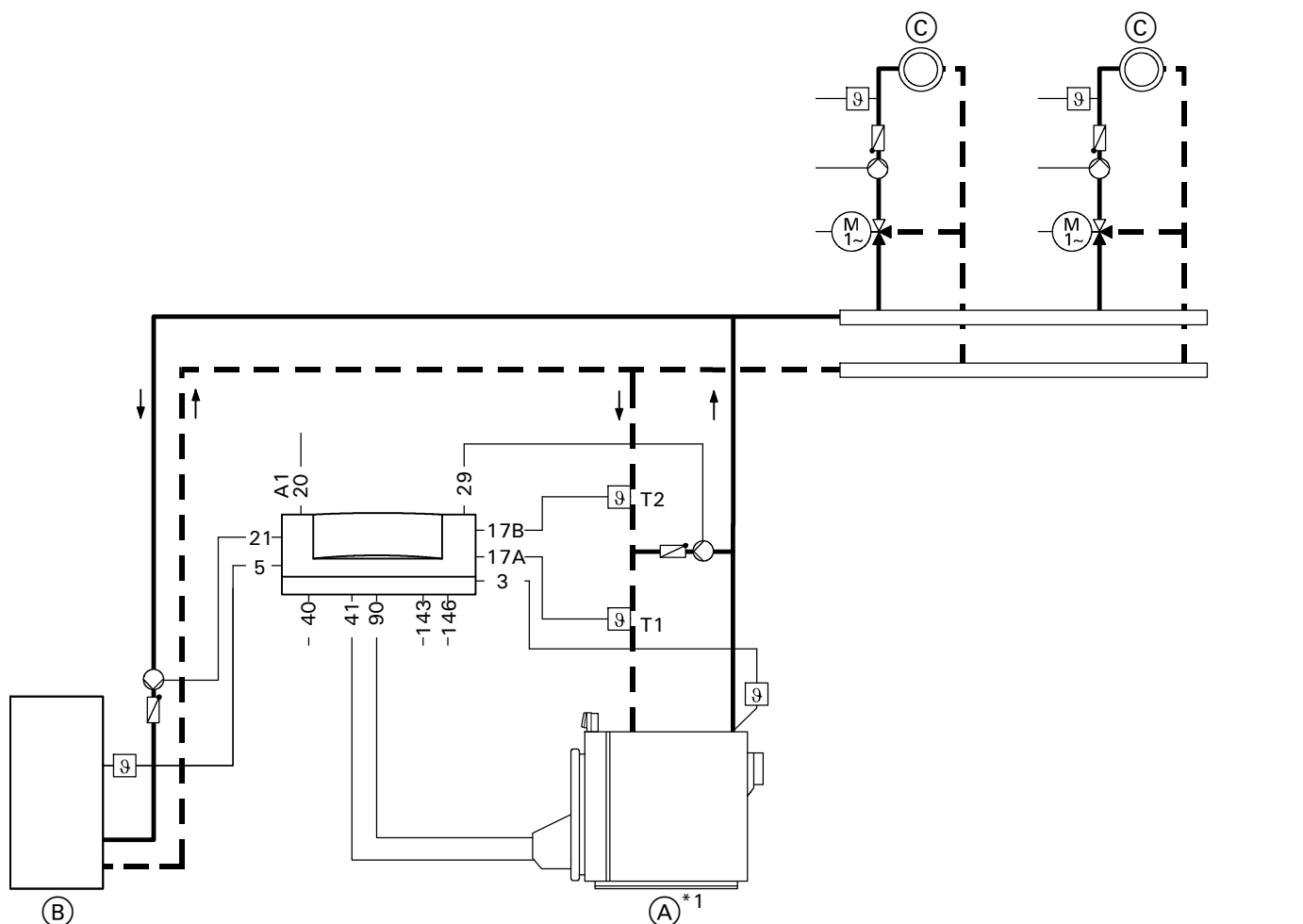
(B) DHW tank

Plug		17 A	Therm-Control temperature sensor	52 M2	Mixing valve motor (only for Vitotronic 300-K)
1	Outdoor temperature sensor (only for Vitotronic 300-K)	20 M2	Heating circuit pump, mixing valve (only for Vitotronic 300-K)	52 M3	Mixing valve motor (only for Vitotronic 300-K)
2 Flow	Flow temperature sensor, common heating flow (only for the Vitotronic 300-K)	20 M3	Heating circuit pump, mixing valve (only for Vitotronic 300-K)	52 M3	Mixing valve motor, Vitotronic 200-H
2 M2	Flow temperature sensor, mixing valve (only for the Vitotronic 300-K)	20	Heating circuit pump Vitotronic 200-H	90	Burner (burner stage 2 / mod.)
2 M3	Flow temperature sensor, mixing valve (only for the Vitotronic 300-K)	28	DHW circulation pump (only for the Vitotronic 300-K)	143 / 146	External connections
2	Flow temperature sensor Vitotronic 200-H	40	Power supply, 120 VAC 60 Hz		
3	Boiler water temperature sensor		Install the main isolator in accordance with regulations		
5	DHW tank temperature sensor (only for Vitotronic 300-K)	41	Burner (stage 1)		
		52 A1	Motorized butterfly valve		

Please refer to the control manual for the Vitocontrol-S, VD2/CT3.

Circuit Diagram 3

Single-boiler system with shunt pump for elevating the return temperature
in conjunction with Vitorond 200, VD2



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve

Plugs

- 3 Boiler temperature sensor
- 5 DHW tank temperature sensor (accessory)
- 17 A Temperature sensor T1
- 17 B Temperature sensor T2
- 20 A1 Close mixing valves with external heating circuit controls
- 21 DHW pump

- 29 Shunt pump
- 40 Power supply connection, 120 VAC
- 41 Burner (1st stage)
- 90 Burner (2nd stage/modulating)
- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

^{*1} On the Vitorond the boiler supply and return are at the rear of the boiler.

Circuit Diagram 3 (continued)

Possible applications
Heating systems with manifold arranged close to the boiler. The boiler water supply is required to be reduced.

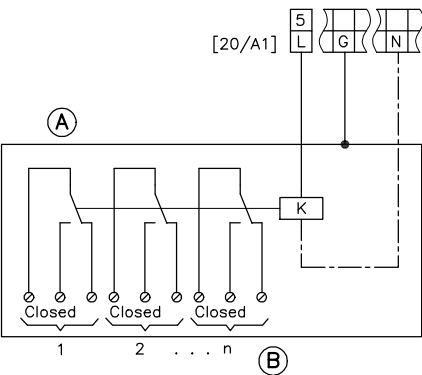
IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

When the return temperature falls below the required minimum value, the temperature sensor T2 switches on the shunt pump. If the minimum return temperature is not reached despite raising the return temperature, the supply must be reduced by at least 50% via the temperature sensor T1.

The shunt pump must be sized so that bypassed water accounts for approx. 30% of the total supply rate of the boiler.

Temperature sensor T1
Wiring of the temperature sensor T1 in heating systems with heating circuit control units which are not connected via the LON BUS to the boiler control unit.
Coding required: "4C: 2" – use plug [20] for closing the mixing valves of the heating circuits connected downstream.



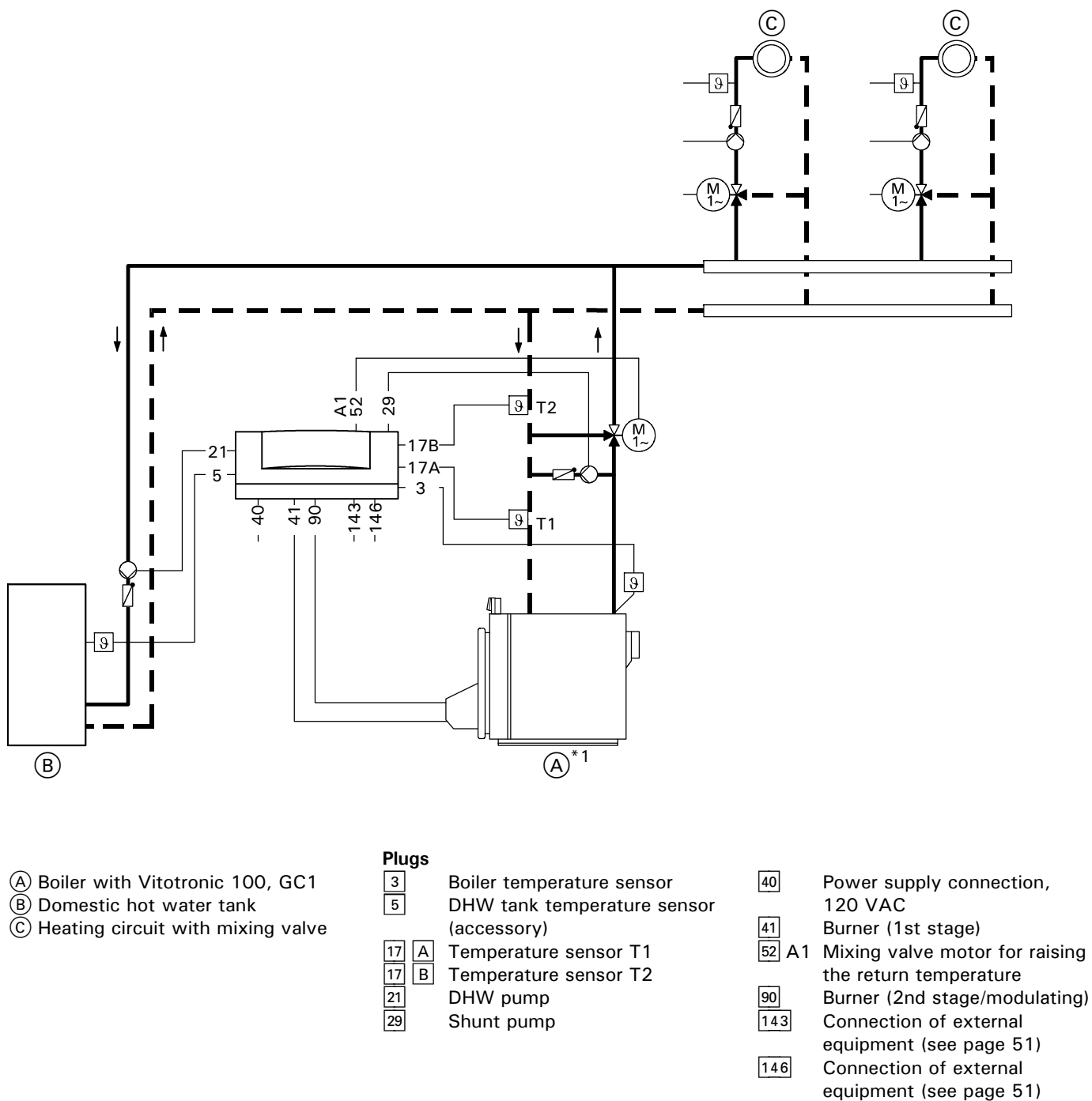
- [20] A1 Close mixing valves
- (A) Contactor relay, field supplied
- (B) Heating circuit controls connected downstream
Switch contact closed: signal for "close mixing valve".

Available system accessories
■ Flue gas temperature sensor

Coding of system type	Change required	Automatic change
00: 1	---	With DHW tank: Coding is automatically changed to "00: 2"
02: 1	Set coding "02: 2" for operation with modulating burner	---
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	---
4A: 0	---	Connection of the temperature sensor T1 at plug [17]A; Coding is automatically changed to "4A: 1"
4b: 0	---	Connection of the temperature sensor T2 at plug [17]B; Coding is automatically changed to "4b: 1"

Circuit Diagram 4

Single-boiler system with shunt pump and return valve for elevating the return temperature
in conjunction with Vitorond 200, VD2



*1 On the Vitorond the boiler supply and return are at the rear of the boiler.

Circuit Diagram 4 *(continued)*

Possible applications

Heating systems in which there is no facility for making modifications or adjustments to the heating circuits connected downstream, e.g. old systems or market gardens.



When the return temperature falls below the required minimum value, the temperature sensor T2 switches on the shunt pump. If, as a result, the required minimum return temperature is not reached, the return valve is proportionally closed via the temperature sensor T1 and the minimum return temperature is assured.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

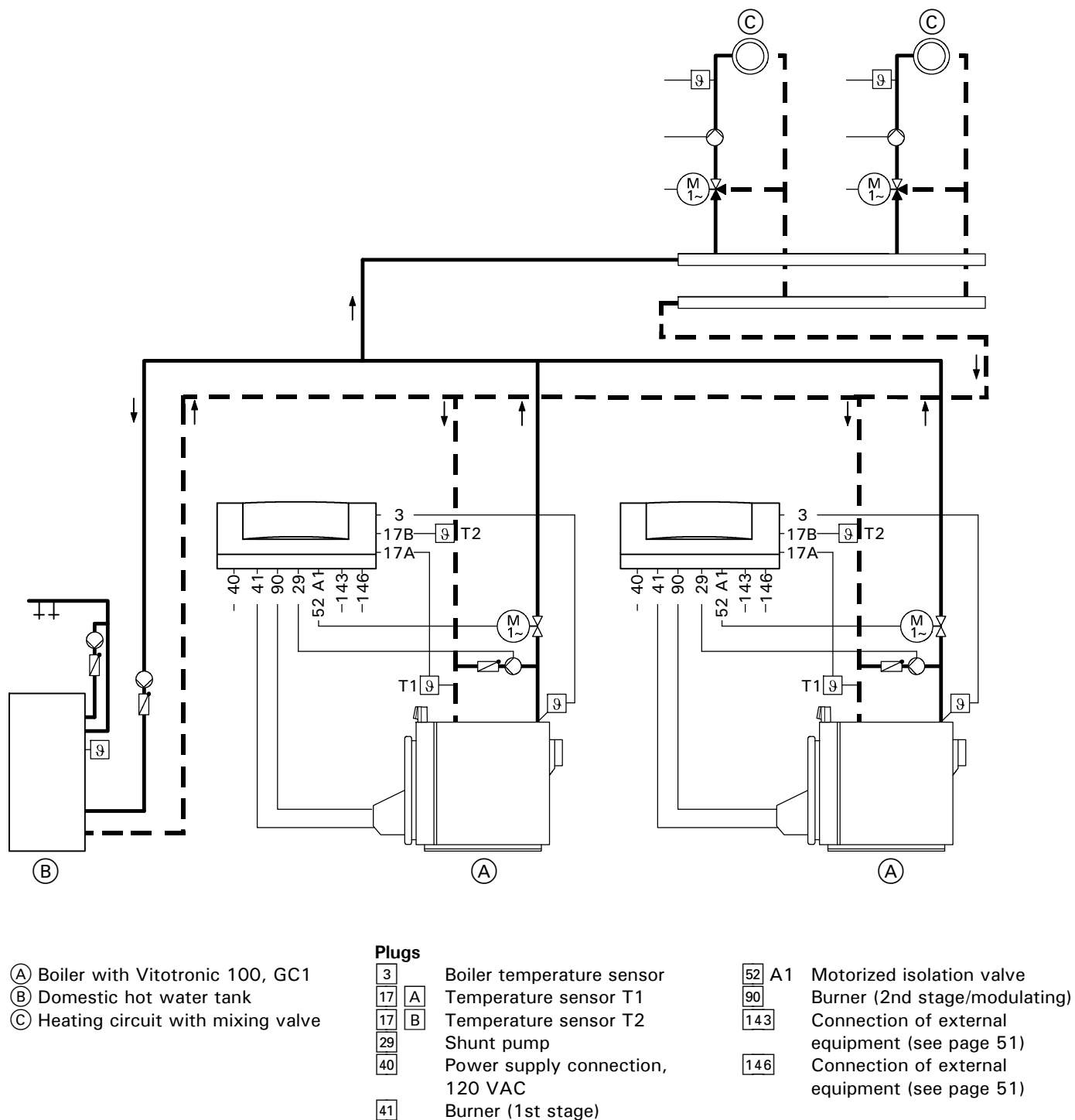
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
00: 1	---	With DHW tank: Coding is automatically changed to "00: 2"
02: 1	Set coding "02: 2" for operation with modulating burner	---
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	---
0C: 4	Set coding "0C: 1" for continuous return temperature control	---
4A: 0	---	Connection of the temperature sensor T1 at plug  A; Coding is automatically changed to "4A: 1"
4b: 0	---	Connection of the temperature sensor T2 at plug  B; Coding is automatically changed to "4b: 1"

Circuit Diagram 5

Multi-boiler system with shunt pump for elevating the return temperature for each boiler
in conjunction with Vitorond 200, VD2



Circuit Diagram 5 *(continued)*

Possible applications

Heating systems with manifold arranged close to the boiler. The boiler water supply is reduced via the motorized isolation valve.

On multi-boiler systems without the Vitotronic 333, the cascade and DHW tank control must be activated by a building automation system.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

When the return temperature falls below the required minimum value, the temperature sensor T2 switches on the shunt pump. If the minimum return temperature is not reached despite raising the return temperature, the supply must be reduced by at least 50% via the temperature sensor T1, through the isolation valve or the heating circuit controls.

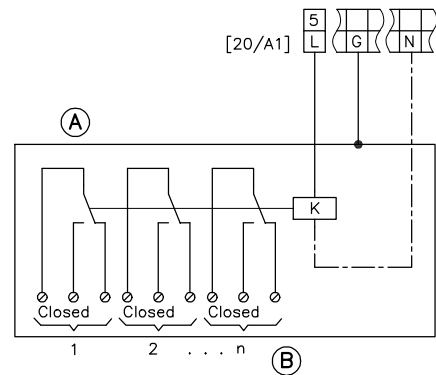
The shunt pump must be sized so that bypassed water accounts for approx. 30% of the total supply rate of the boiler.

The boiler is assured optimum protection in conjunction with control of the heating circuits via the Vitotronic 050 connected to the boiler control unit. No further protective measures are required on site.

Temperature sensor T1

Wiring of the temperature sensor T1 in heating systems with heating circuit control units which are not connected via the LON BUS to the boiler control unit.

Coding required: "4C: 2" – use plug [20] for closing the mixing valves of the heating circuits connected downstream.



- [20] A1 Close mixing valves
- (A) Contactor relay, field supplied
- (B) Heating circuit controls connected downstream
- Switch contact closed: signal for "close mixing valve".

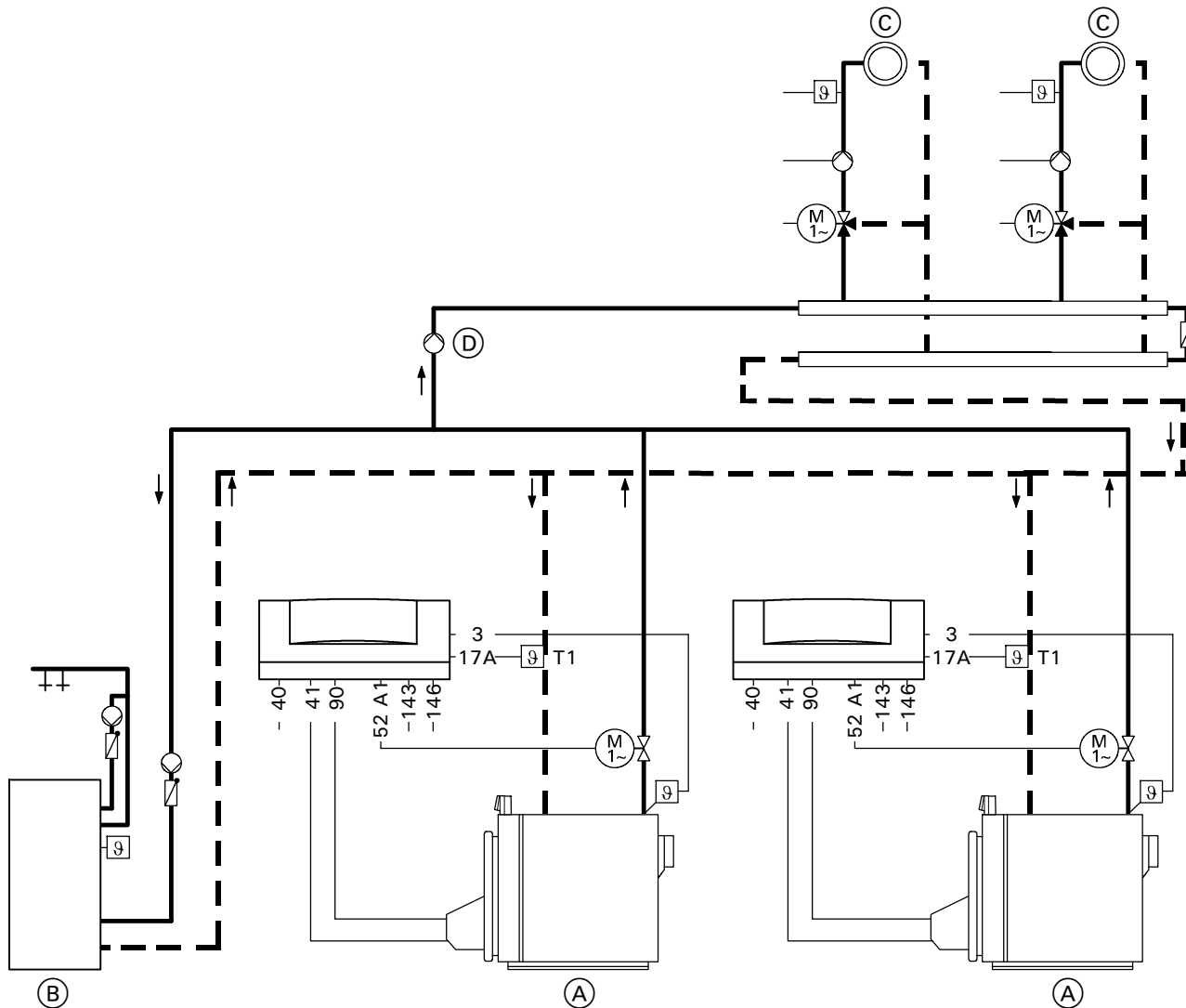
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	---
4A: 0	---	Connection of the temperature sensor T1 at plug [17]A; Coding is automatically changed to "4A: 1"
4b: 0	---	Connection of the temperature sensor T2 at plug [17]B; Coding is automatically changed to "4b: 1"

Circuit Diagram 6

Multi-boiler system with common supply pump and low-pressure manifold
in conjunction with Vitorond 200, VD2



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve
- (D) Common supply pump

Plugs

- 3 Boiler temperature sensor
- 17 A Temperature sensor T1
- 40 Power supply connection, 120 VAC
- 41 Burner (1st stage)
- 52 A1 Motorized isolation valve

- 90 Burner (2nd stage/modulating)
- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

Where the manifold is arranged in distant substations (> 20 m). The heat transferred to the heating circuits is required to be reduced.

On multi-boiler systems without Vitotronic 333, the boiler staging and DHW tank control must be activated by a building automation system.

The common supply pump is activated by the master control of the building management system. It must be switched on when a boiler is engaged.

IMPORTANT

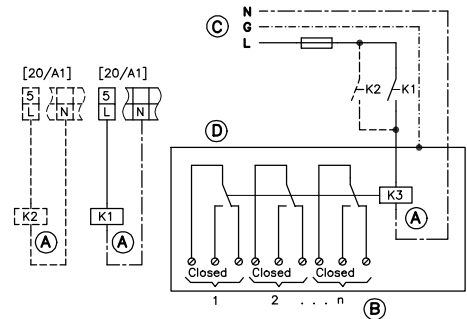
This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

When the return temperature falls below the required minimum value, the mixing valves are partially or fully closed via the temperature sensor T1. The common supply pump must be sized on the basis of 110% of the total supply Btu/hr output rate of the heating system.

The boiler is assured optimum protection in conjunction with control of the heating circuits via a Vitotronic 050 connected to the boiler control unit. No further protective measures are required on site.

Temperature sensor T1

Wiring for reducing the supply via temperature sensor T1 in heating systems with heating circuit control units which are not connected via the LON BUS to the boiler control unit. Coding required: "4C: 2" – use plug [20](#) for closing the mixing valves of the heating circuits connected downstream.




- 20 A1 Close mixing valves
- A Contactor relay, field supplied
- B Heating circuit controls connected downstream
- Switch contact closed: signal for "close mixing valve"
- C Power supply connection, 120 VAC
- D Junction box, field supplied

If an external cascade control unit is used, the distributor pump must be connected to the external control unit.

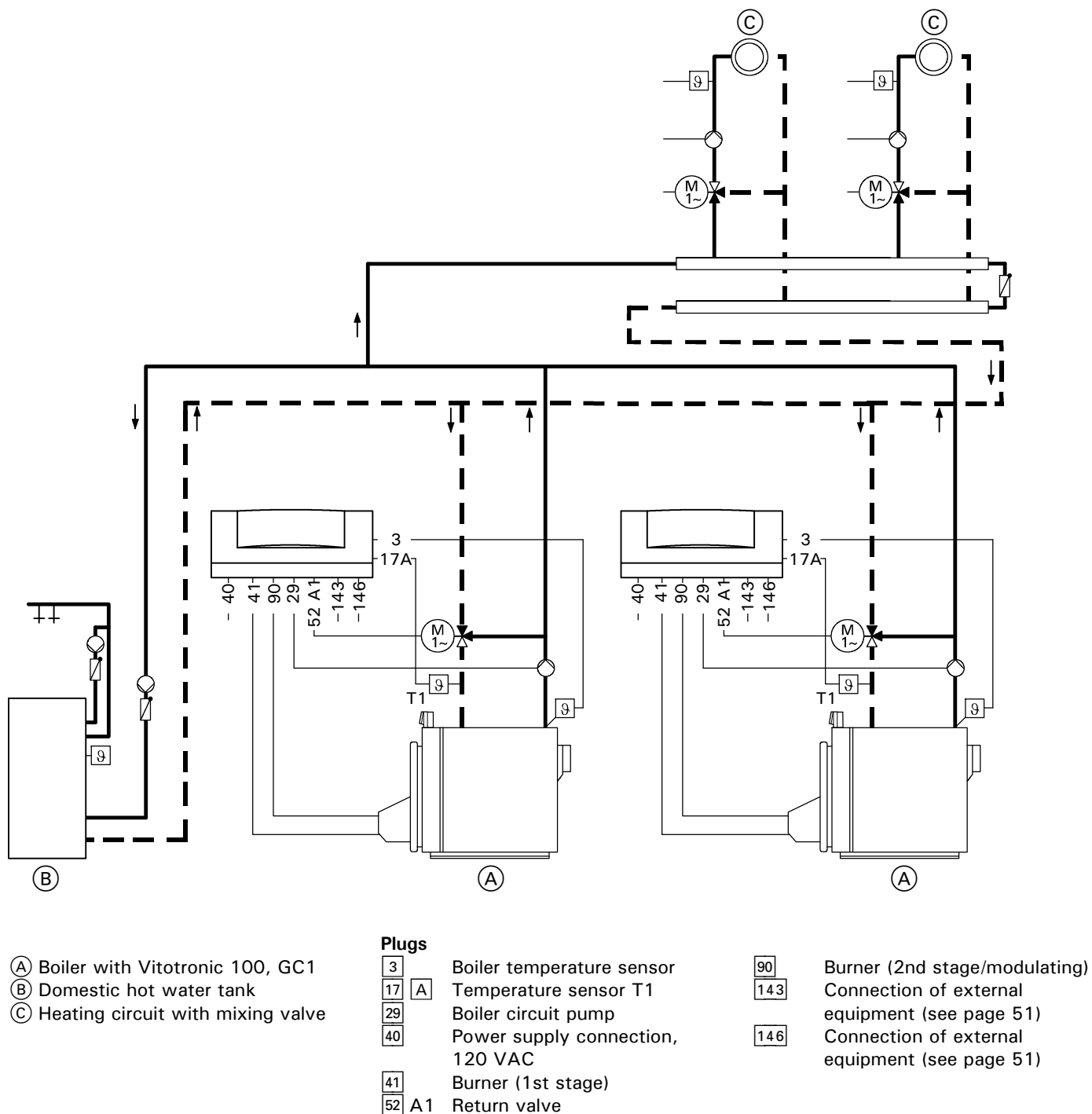
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	---
0d: 2	Set coding "0d: 1" Therm-Control is effective for the mixing valves of the heating circuits connected downstream	---
4A: 0	---	Connection of the temperature sensor T1 at plug  ; Coding is automatically changed to "4A: 1"

Circuit Diagram 7

Multi-boiler system with return valve for return temperature protection
in conjunction with Vitorond 200, VD2



Circuit Diagram 7 *(continued)*

Possible applications

E.g. old systems or systems in market gardens and/or systems in which there is no facility for making modifications or adjustments to the heating circuits connected downstream.

The cascade and DHW tank control must be activated by a building automation system.

When the return temperature falls below the required minimum value, the 3-port mixing valve on the boilers is proportionally closed via the temperature sensor T1, thereby assuring protection of the boiler.

The boiler and the heating circuits downstream are hydraulically decoupled. The supply temperature is controlled via the common temperature sensor.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

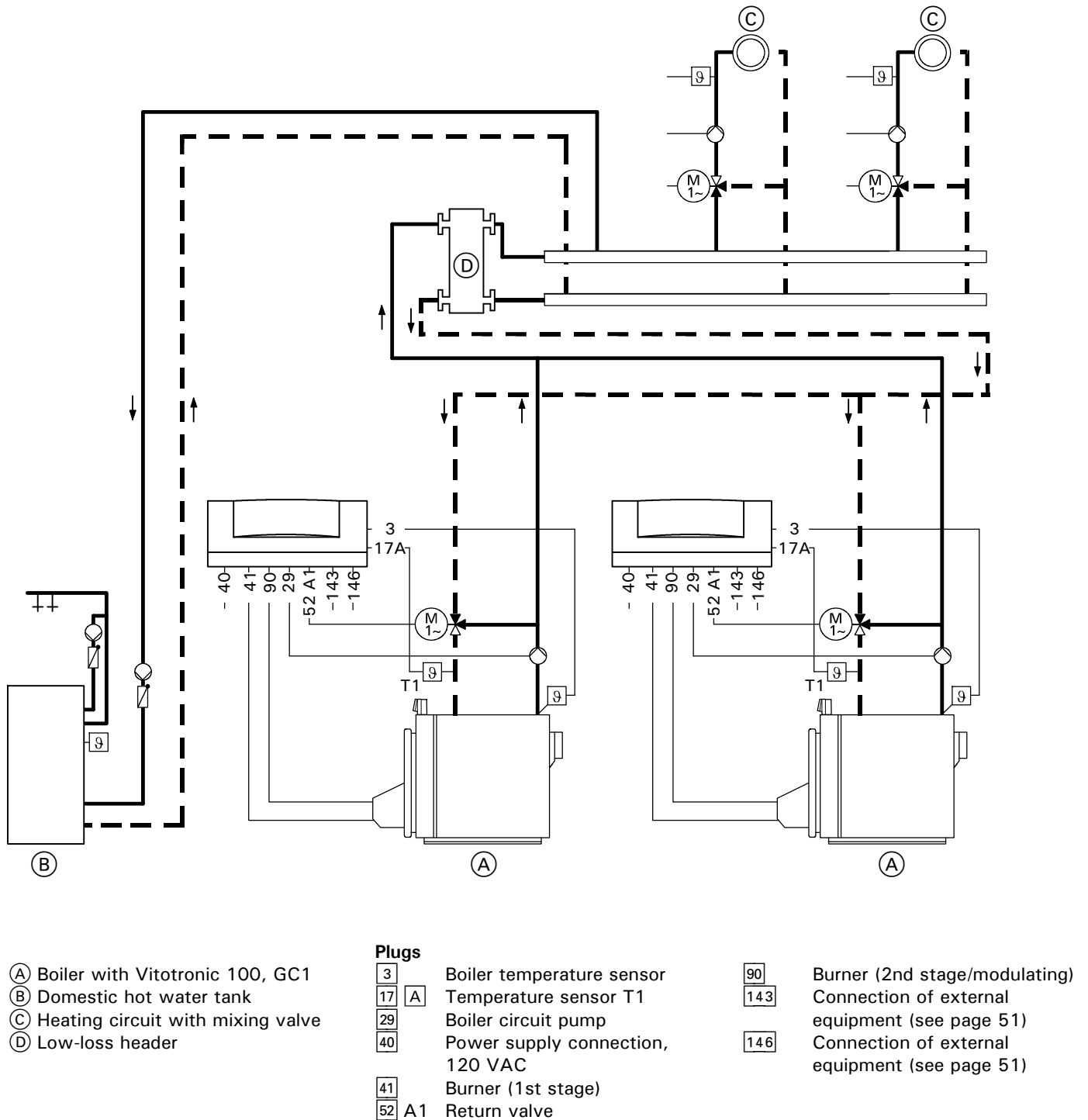
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	---
0C: 4	Set coding "0C: 1" for continuous return temperature control	---
4A: 0	---	Connection of the temperature sensor T1 at plug 17 A ; Coding is automatically changed to "4A: 1"
4d: 1	Set coding "4d: 2" for boiler circuit pump at plug 29	---

Circuit Diagram 8

Multi-boiler system with low-loss header and return valve for elevating the return temperature
in conjunction with Vitorond 200, VD2



Circuit Diagram 8 *(continued)*

Possible applications

E.g. old systems or systems in market gardens as well as systems in which there is a lack of clarity in the hydraulic installation and/or systems where there is no facility for making modifications or adjustments to the heating circuits connected downstream.

The cascade and DHW tank control must be activated by a building automation system.

When the return temperature falls below the required minimum value, the return valve on the boilers is proportionally closed via the temperature sensor T1, thereby assuring protection of the boiler.

The supply temperature is controlled by the temperature sensor in the low-loss header.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.



CAUTION

The boiler circuit pumps on each boiler must be sized so that their supply is at least equal to the maximum possible total heating circuit supply.

Recommendation: 110%.

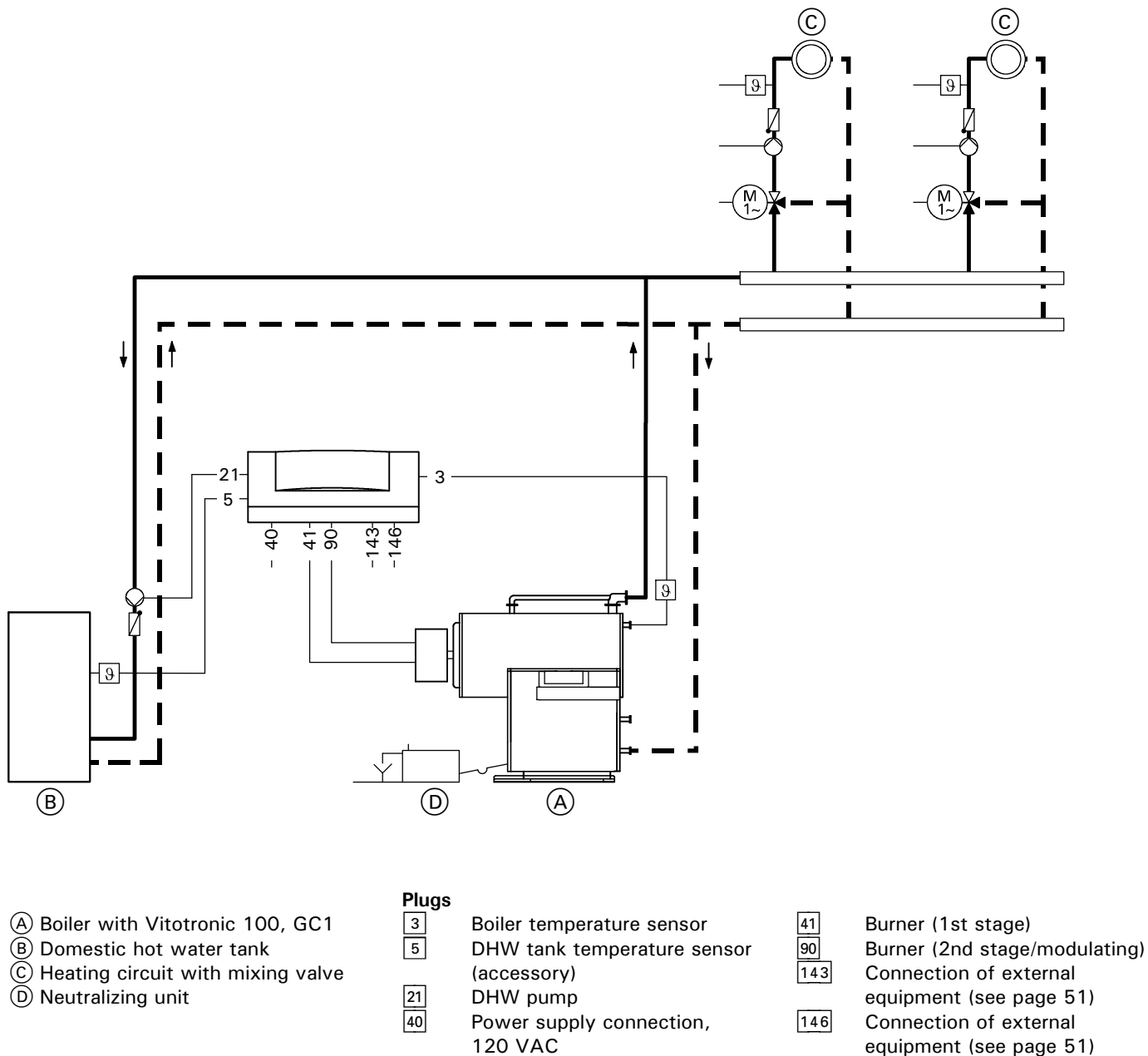
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	---
0C: 4	Set coding "0C: 1" for continuous return temperature control	---
4A: 0	---	Connection of the temperature sensor T1 at plug ; Coding is automatically changed to "4A: 1"
4d: 1	Set coding "4d: 2" for boiler circuit pump at plug	---

Circuit Diagram 9

Several heating circuits and one mixing valve heating circuit
Single-boiler system with Vitocrossal 300



Circuit Diagram 9 (continued)

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

The Vitocrossal 300 is operated with constant boiler water temperature by means of the boiler control unit. Two-stage or modulating burners can be controlled.

The boiler water temperature which is established in the heating mode is higher than the maximum heating system supply temperature by an adjustable difference.

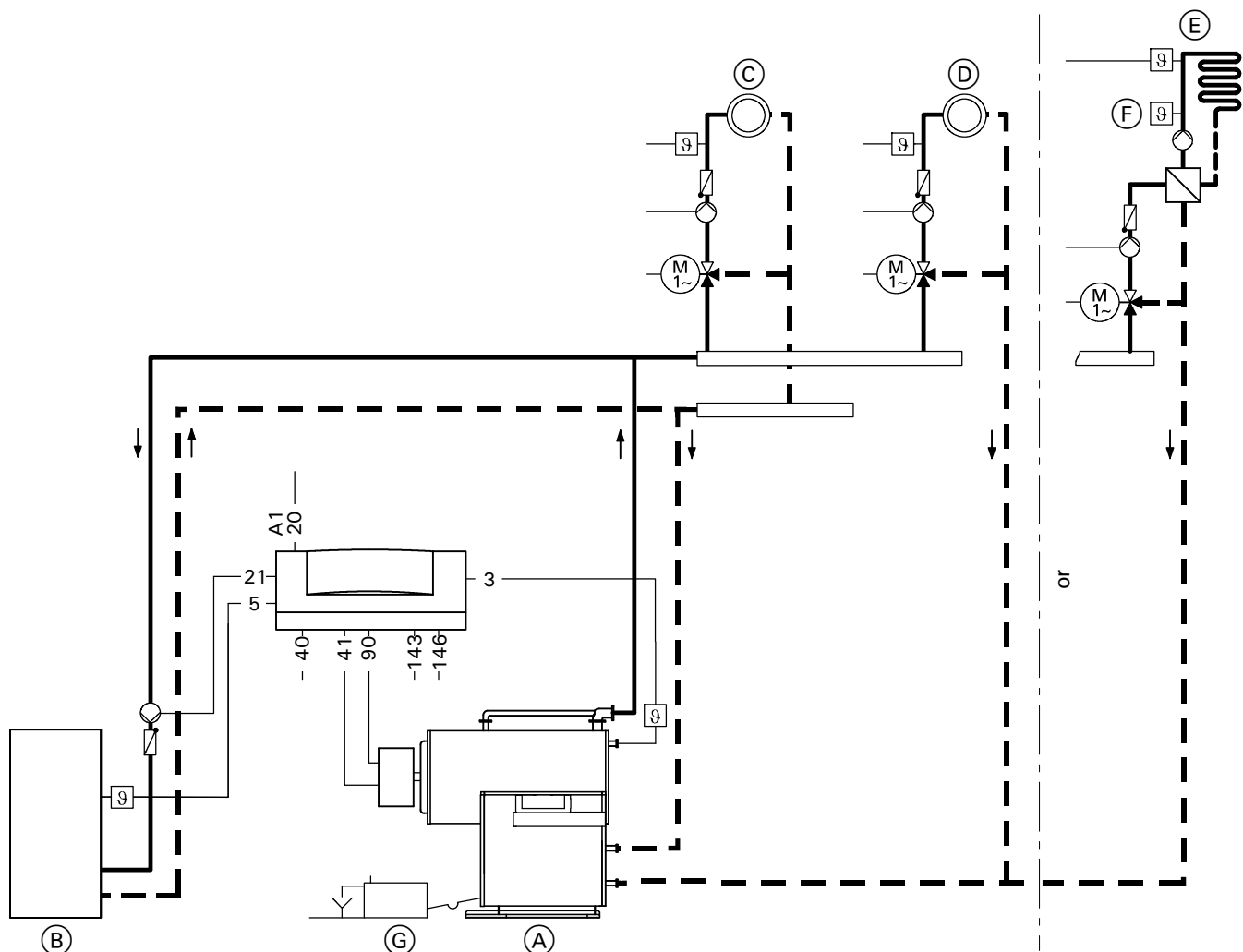
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
00: 1	---	With DHW tank: Coding is automatically changed to "00: 2"
02: 1	Set coding "02: 2" for operation with modulating burner	---
0C: 4	Set coding "0C: 0"	---
0d: 2	Set coding "0d: 0"	---

Circuit Diagram 10

Single-boiler system with several heating circuits and one mixing valve heating circuit in conjunction with Vitocrossal 300



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve
- (D) Mixing valve heating circuit or
- (E) Underfloor heating circuit with mixing valve
- (F) Limit thermostat (max. limit)
- (G) Neutralizing unit

Plugs

- 3 Boiler temperature sensor
- 5 DHW tank temperature sensor (accessory)
- 20 A1 Close mixing valves with external heating circuit controls
- 21 DHW pump

- 40 Power supply connection, 120 VAC
- 41 Burner (1st stage)
- 90 Burner (2nd stage/modulating)
- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

Circuit Diagram 10 *(continued)*

Possible applications

For heating circuits with different temperatures.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

The Vitocrossal 300 is operated with constant boiler water temperature by means of the boiler control unit. Two-stage or modulating burners can be controlled.

The Vitocrossal 300 has two return connections. The heating circuits with the higher return temperature are connected to the return connection at the top, those with the lower temperatures to the return connection at the bottom.

Please note:

At least 15% of the take-off from the rated output must be connected to the return connection at the bottom.

The boiler water temperature which is established in the heating mode is higher than the maximum heating circuit supply temperature by an adjustable difference.

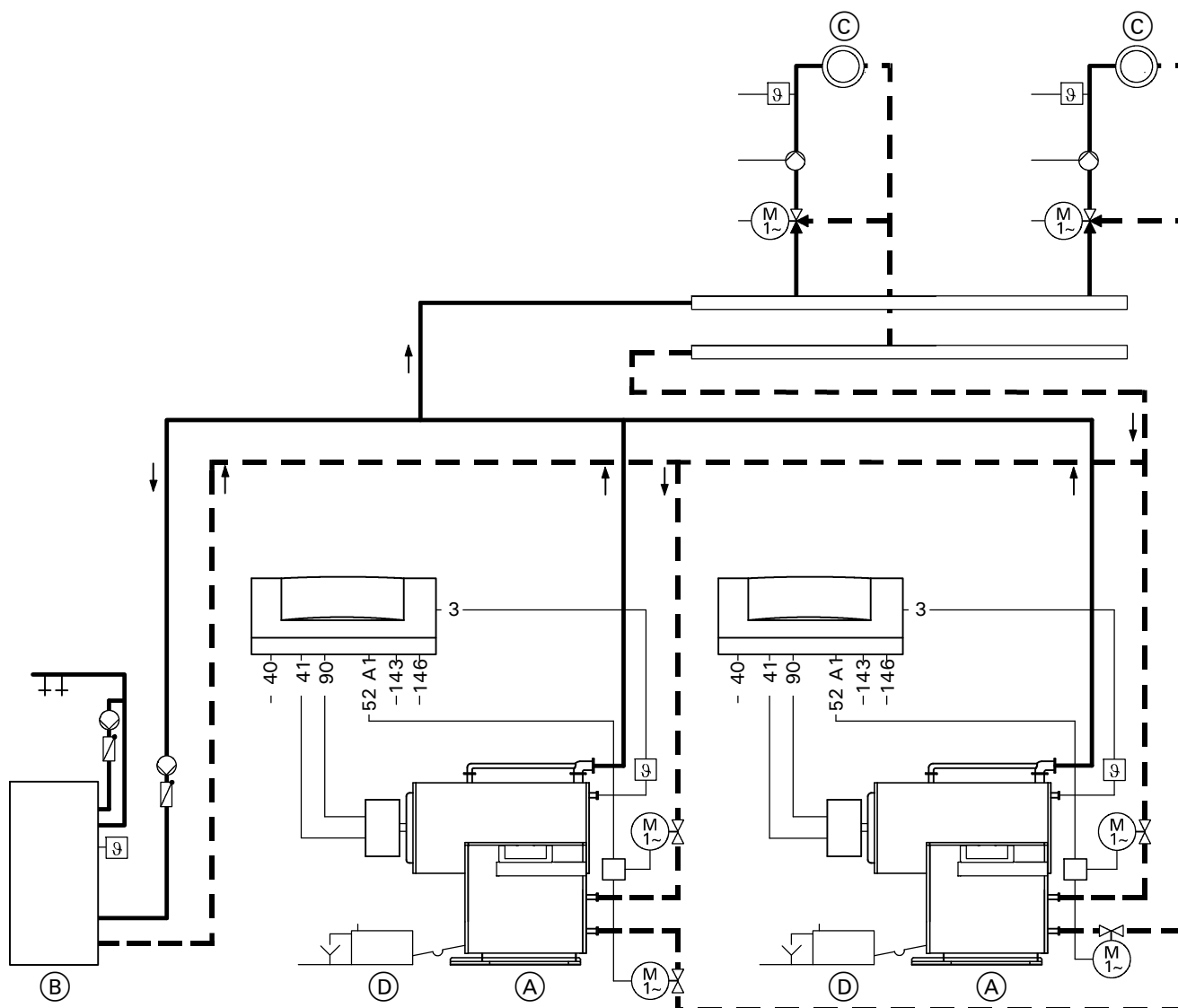
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
00: 1	---	With DHW tank: Coding is automatically changed to "00: 2"
02: 1	Set coding "02: 2" for operation with modulating burner	---
0C: 4	Set coding "0C: 0"	---
0d: 2	Set coding "0d: 0"	---

Circuit Diagram 11

Multi-boiler system with several heating circuits and one mixing valve heating circuit in conjunction with Vitocrossal 300



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve
- (D) Neutralizing unit

Plugs

- 3 Boiler temperature sensor
- 40 Power supply connection, 120 VAC
- 41 Burner (1st stage)
- 52 A1 Motorized isolation valve
- 90 Burner (2nd stage/modulating)

- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

Circuit Diagram 11 *(continued)*

Possible applications

The cascade and DHW tank control must be activated by a building automation system.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

The Vitocrossal 300 is operated with constant boiler water temperature by means of the boiler control unit. Two-stage or modulating burners can be controlled.

The Vitocrossal 300 has two return connections. The heating circuits with the higher return temperature are connected to the return connection at the top, those with the lower temperatures to the return connection at the bottom.

Please note:

At least 15% of the take-off from the rated output must be connected to the return connection at the bottom.

The boiler water temperature which is established in the heating mode is higher than the maximum heating circuit supply temperature by an adjustable difference.

Motorized isolation valve

Connect motorized isolation valve adaptor (Part No. 7134 560) or 24V valve adaptor (Part No. 7134 559), installed in connection enclosure, in parallel.

Use electric junction box if necessary.

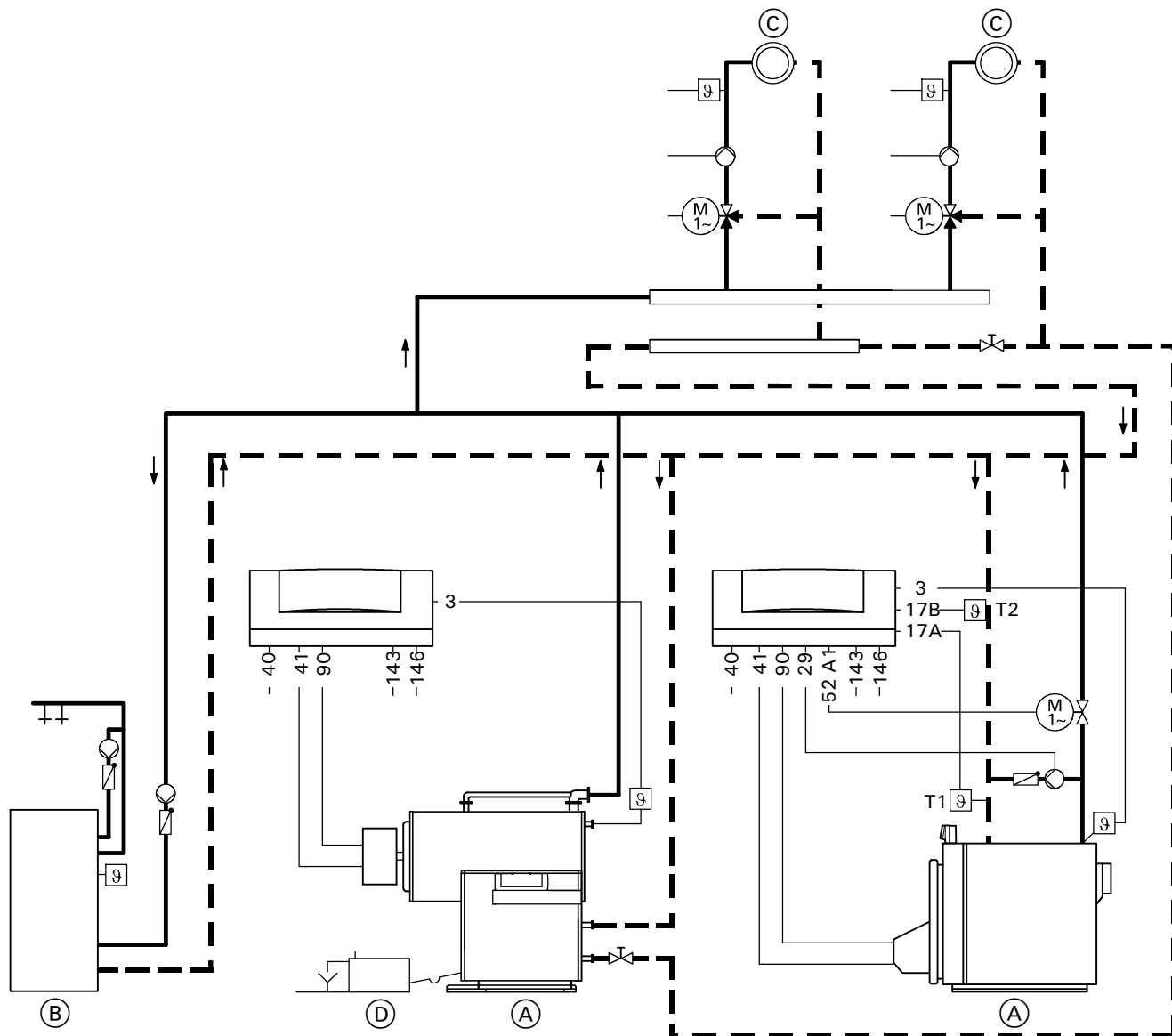
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
0d: 2	Set coding "0d: 0"	---

Circuit Diagram 12

Multi-boiler system with several heating circuits, one mixing valve heating circuit and Vitorond with shunt pump in conjunction with Vitocrossal 300 and Vitorond 200



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve
- (D) Neutralizing unit

Plugs

- 3 Boiler temperature sensor
- 17 A Temperature sensor T1
- 17 B Temperature sensor T2
- 29 Shunt pump
- 40 Power supply connection, 120 VAC
- 41 Burner (1st stage)

- 52 A1 Motorized isolation valve
- 90 Burner (2nd stage/modulating)
- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

Circuit Diagram 12 *(continued)*

Possible applications

The cascade and DHW tank control must be activated by a building automation system.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

The Vitocrossal 300 (lead boiler) and the Vitorond lag boilers are operated with modulating boiler water temperature and load-dependent sequential control by means of the outdoor-reset logic control system. Two-stage or modulating burners can be controlled.

Through the control system which is linked via the LON BUS, the boiler supply temperature which is established is higher than the maximum heating circuit supply temperature by an adjustable difference. The heating system can be operated in accordance with a separate heating curve.

The Vitocrossal 300 boilers have two return connections. The heating circuits with the higher return temperature are connected to the return connection at the top, those with the lower temperatures to the return connection at the bottom.

Please note:



At least 15% of the take-off from the rated output must be connected to the return connection at the bottom.

The return temperature raising functionality of the Vitorond modulating boiler is available as an accessory or must be provided on site.

The return temperature is raised by means of the shunt pump and by closing the isolation valve. The temperature sensor T1 activates the isolation valve. The temperature sensor T2 switches the shunt pump.

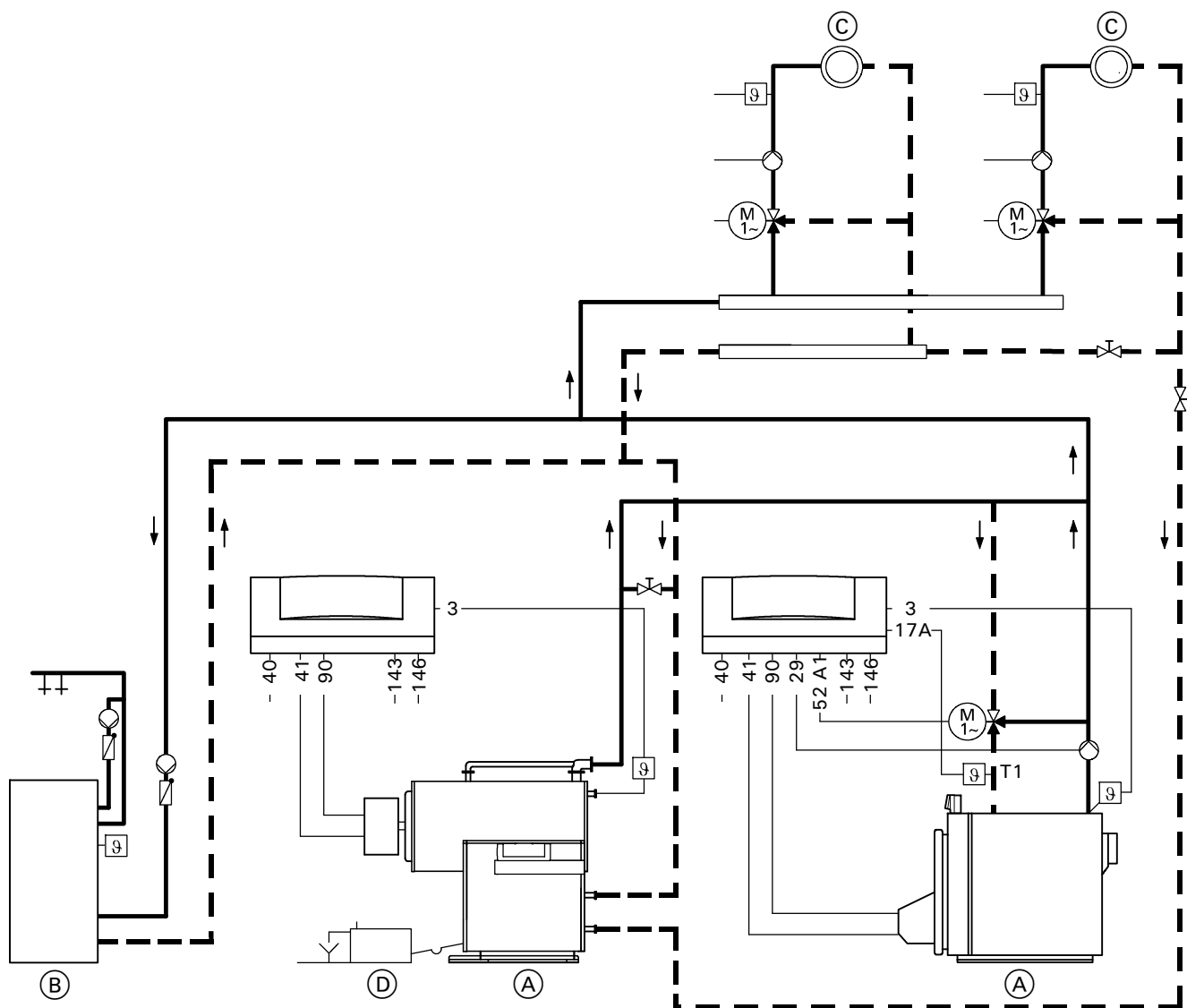
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
0C: 4	Only with Vitotronic 100 for the Vitocrossal 300: Set coding "0C: 0"	---
0d: 2	Set coding "0d: 0"	---
4A: 0	---	Only with Vitotronic 100 for the Vitorond: Connection of the temperature sensor T1 at plug  A; Coding is automatically changed to "4A: 1"
4b: 0	---	Only with Vitotronic 100 for the Vitorond: Connection of the temperature sensor T2 at plug  B; Coding is automatically changed to "4b: 1"

Circuit Diagram 13

Multi-boiler system with return valve, several heating circuits and one mixing valve heating circuit
in conjunction with Vitocrossal 300 and Vitorond 200



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve
- (D) Neutralizing unit

Plugs

- 3 Boiler temperature sensor
- 17 [A] Temperature sensor T1
- 29 Boiler circuit pump
- 40 Power supply connection, 120 VAC
- 41 Burner (1st stage)
- 52 A1 3-port mixing valve

- 90 Burner (2nd stage/modulating)
- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

Circuit Diagram 13 *(continued)*

Possible applications

For heating circuits with temperature differences ≥ 20 K.

The cascade and DHW tank control must be activated by a building automation system.

IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

The Vitocrossal 300 (lead boiler) and the Vitorond lag boilers are operated with modulating boiler water temperature and load-dependent sequential control by means of the outdoor-reset logic control system. Two-stage or modulating burners can be controlled.

Through the control system which is linked via the LON BUS, the boiler supply temperature which is established is higher than the maximum heating circuit supply temperature by an adjustable difference. The heating system can be operated in accordance with a separate heating curve.

The Vitocrossal 300 boilers have two return connections. The heating circuits with the higher return temperature are connected to the return connection at the top, those with the lower temperatures to the return connection at the bottom.

Please note:

At least 15 % of the take-off from the rated output must be connected to the return connection at the bottom.

The T1 temperature sensor measures the return temperature. The return valve is activated via the boiler control unit so as to ensure that the return temperature does not fall below the minimum value.

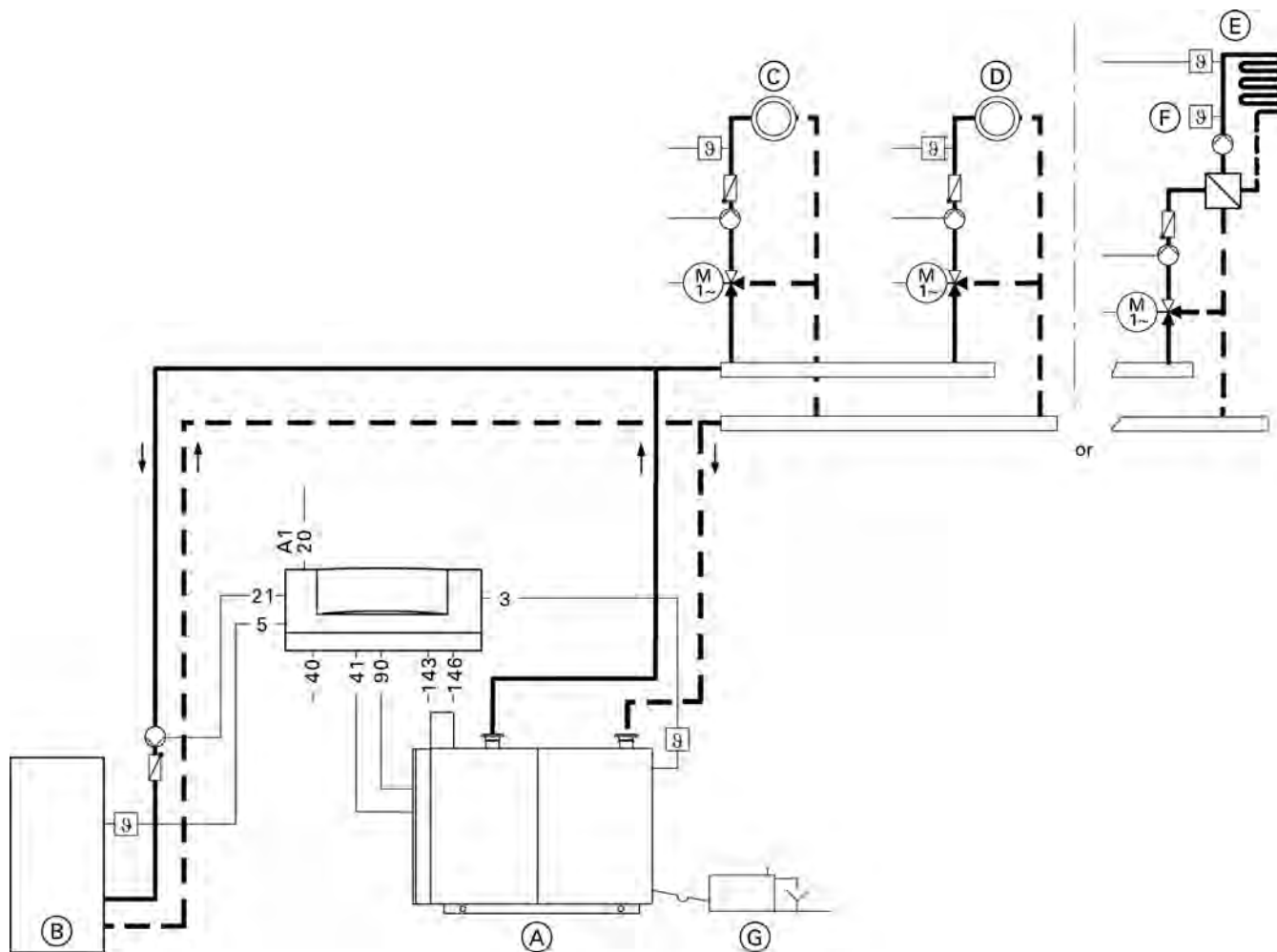
Available system accessories

- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
0C: 4	Only with Vitotronic 100 for the Vitocrossal 300: Set coding "0C: 0" Only with Vitotronic 100 for the Vitorond 300: Set coding "0C: 1" for continuous return temperature control	---
0d: 2	Only with Vitotronic 100 for the Vitocrossal 300: Set coding "0d: 0"	---
4A: 0	---	Only with Vitotronic 100 for the Vitorond: Connection of the Therm-Control temperature sensor at plug 17 A ; Coding is automatically changed to "4A: 1"
4d: 1	Only with Vitotronic 100 for the Vitocrossal 300: Set coding "4d: 2" for boiler circuit pump at plug 29	

Circuit Diagram 14 (CM2 only)

Single-boiler system with several heating circuits and one mixing valve heating circuit in conjunction with Vitocrossal 200



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve
- (D) Mixing valve heating circuit or
- (E) Underfloor heating circuit with mixing valve
- (F) Limit thermostat (max. limit)
- (G) Neutralizing unit

Plugs

- 3 Boiler temperature sensor
- 5 DHW tank temperature sensor (accessory)
- 20 A1 Close mixing valves with external heating circuit controls
- 21 DHW pump

- 40 Power supply connection, 120 VAC
- 41 Burner
- 90 Burner modulation
- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

Circuit Diagram 14 (CM2 only) *(continued)*

Possible applications

For heating circuits with different temperatures.

The Vitocrossal 200 is operated with constant boiler water temperature by means of the boiler control unit and the Viessmann fully modulating burner.

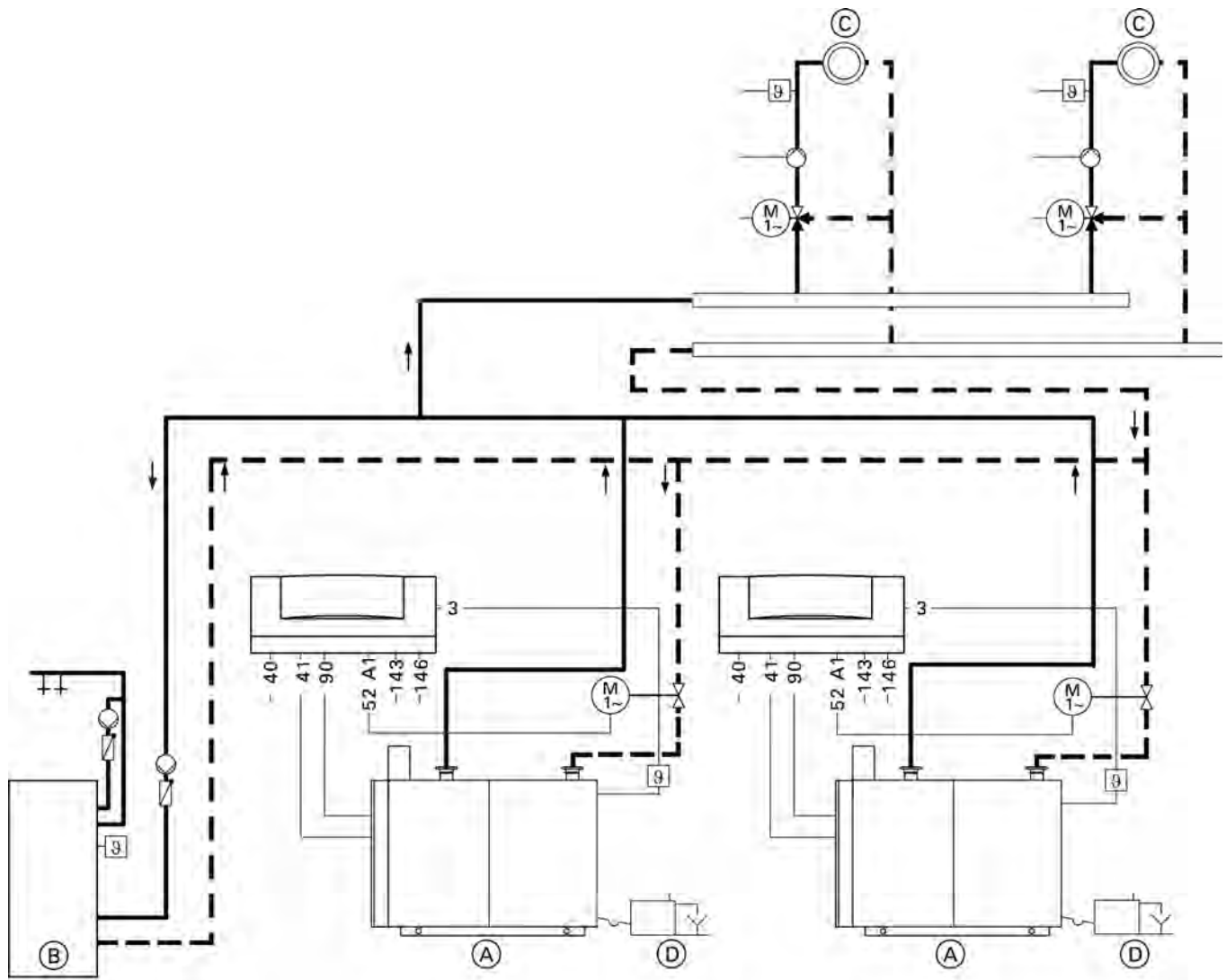
IMPORTANT

This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional.

Coding of system type	Change required	Automatic change
00: 1	---	With DHW tank: Coding is automatically changed to "00: 2"
02: 1	Set coding "02: 2" for operation with modulating burner	---
0C: 4	Set coding "0C: 0"	---
0d: 2	Set coding "0d: 0"	---

Circuit Diagram 15 (CM2 only)

Multi-boiler system with several heating circuits and one mixing valve heating circuit in conjunction with Vitocrossal 200



- (A) Boiler with Vitotronic 100, GC1
- (B) Domestic hot water tank
- (C) Heating circuit with mixing valve
- (D) Neutralizing unit

Plugs

- 3 Boiler temperature sensor
- 40 Power supply connection, 120 VAC
- 41 Burner
- 52 A1 Motorized isolation valve
- 90 Burner modulation

- 143 Connection of external equipment (see page 51)
- 146 Connection of external equipment (see page 51)

Circuit Diagram 15 (CM2 only) *(continued)*

Possible applications

The cascade and DHW tank control must be activated by a building automation system.

The Vitocrossal 200 is operated with constant boiler water temperature by means of the boiler control unit and the Viessmann fully modulating burner.

Motorized isolation valve

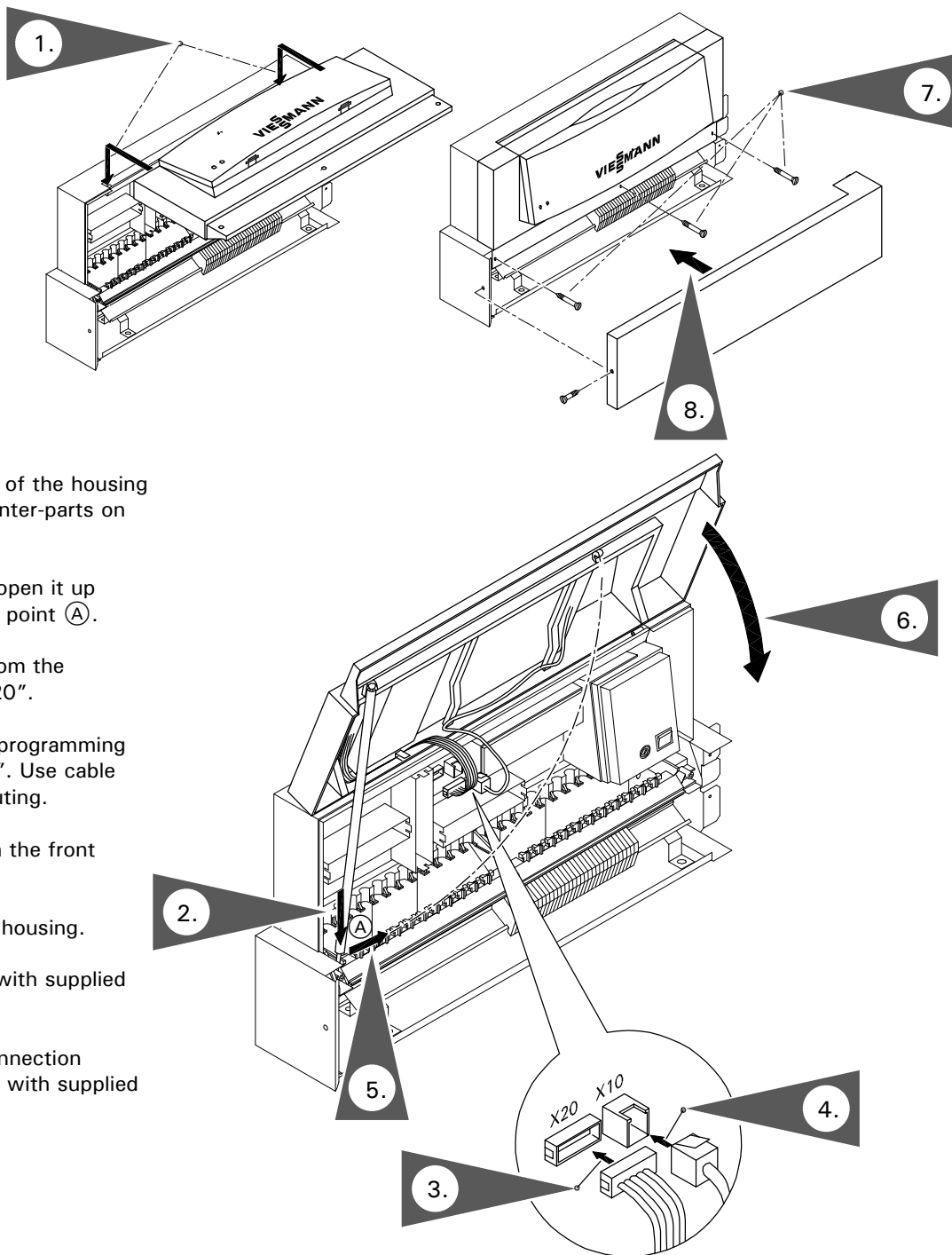
Connect motorized 120V isolation valve adaptor (Part No. 7511 367) or 24V valve adaptor (Part No. 7511 366), installed in connection enclosure, in parallel. Use electric junction box if necessary.

IMPORTANT

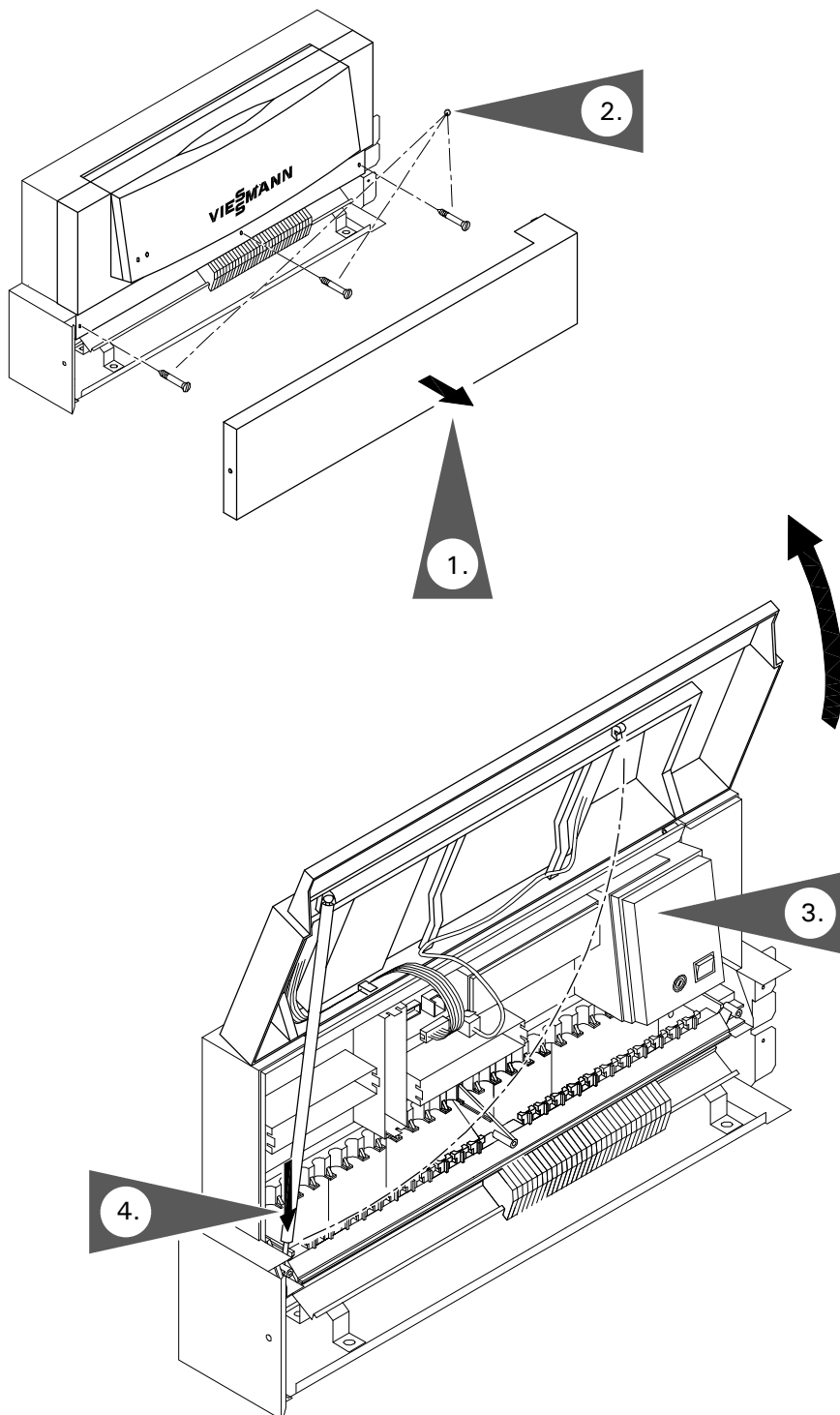
This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or heating contractor to check that this recommendation is complete and fully functional.

Coding of system type	Change required	Automatic change
01: 1	Set coding "01: 3" for multi-boiler system with external cascade control via switch contacts	---
02: 1	Set coding "02: 2" for operation with modulating burner	---
0d: 2	Set coding "0d: 0"	---

Mounting the Front Part of the Control Unit (VD2/VD2A/CT3 only)

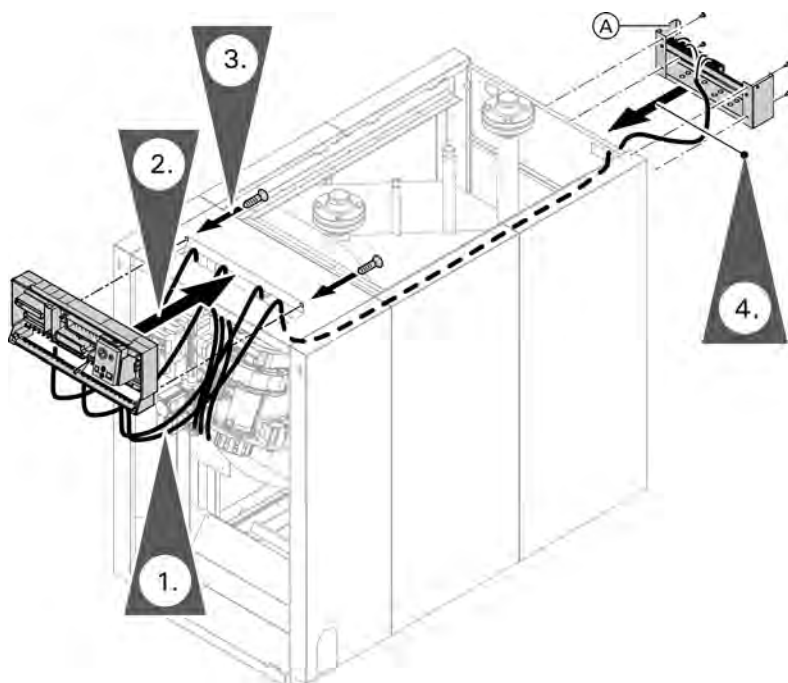


Opening the Control Unit (VD2/VD2A/CT3 only)



1. Remove the cover of the connection enclosure.
2. Unscrew the screws from the front housing.
3. Swing up the front part of the control housing.
4. Position the stay bar so that it supports the front housing.

Control and Junction Box Installation Instructions (for CM2 only)



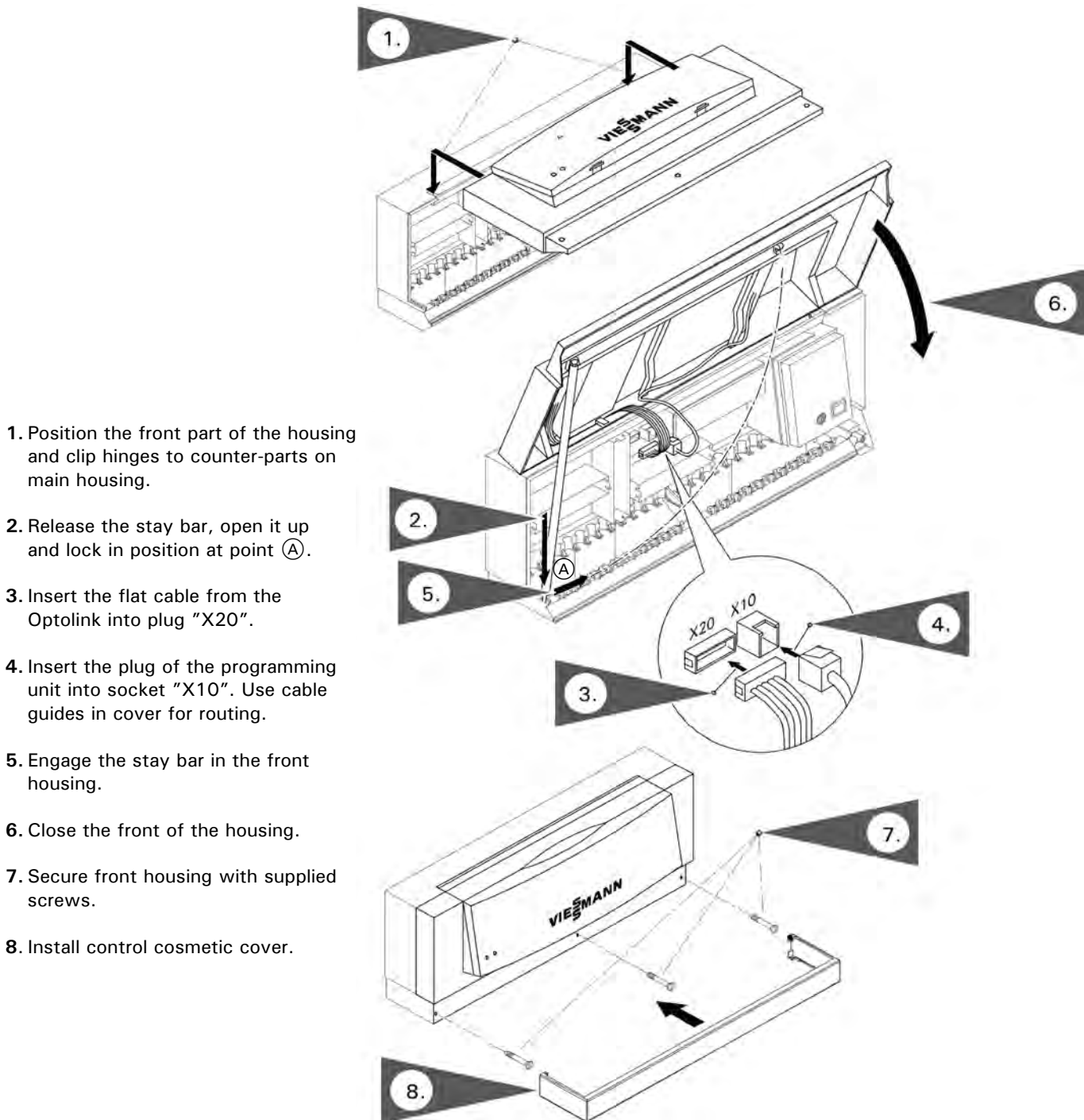
1. Route cables and capillaries from control through the opening in the control panel. Guide the cables to the junction box through the opening in the rear panel and along the top rail to the control. Secure all cables to the rail with cable ties. Insert capillaries into the sensor well.
Note: Never allow cables to come in contact with hot metal components.

WARNING

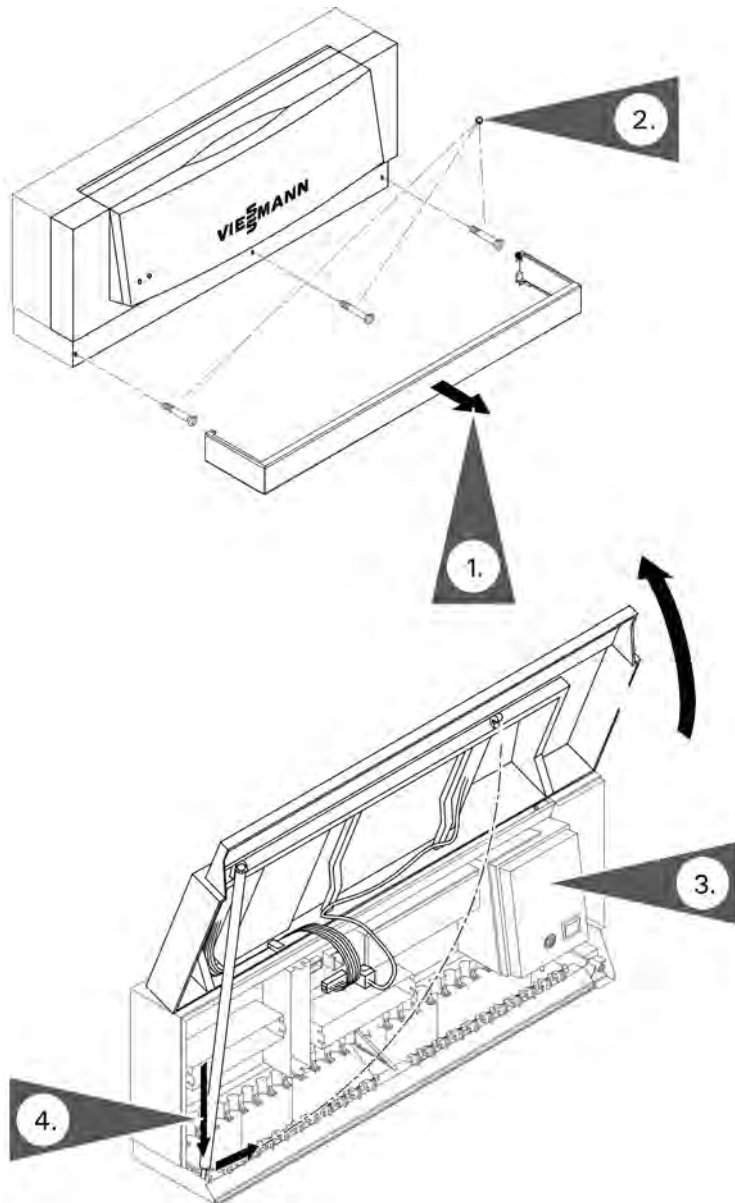
Do not bend or kink the capillaries. Damaging the capillaries leads to malfunction.

2. Mount the control to the control panel.
3. Secure the control to the control panel with screws.
Note: Screws to secure control are included with the cosmetic cover in the boiler jacketing package.
4. Install the junction box to the rear panel either right or left. Secure the junction box with 4 x 4.8 metal screws.
Note: The ground screw and ground wire can be reinstalled with the boiler back panel attached.

Mounting the Front Part of the Control Unit (CM2 only)

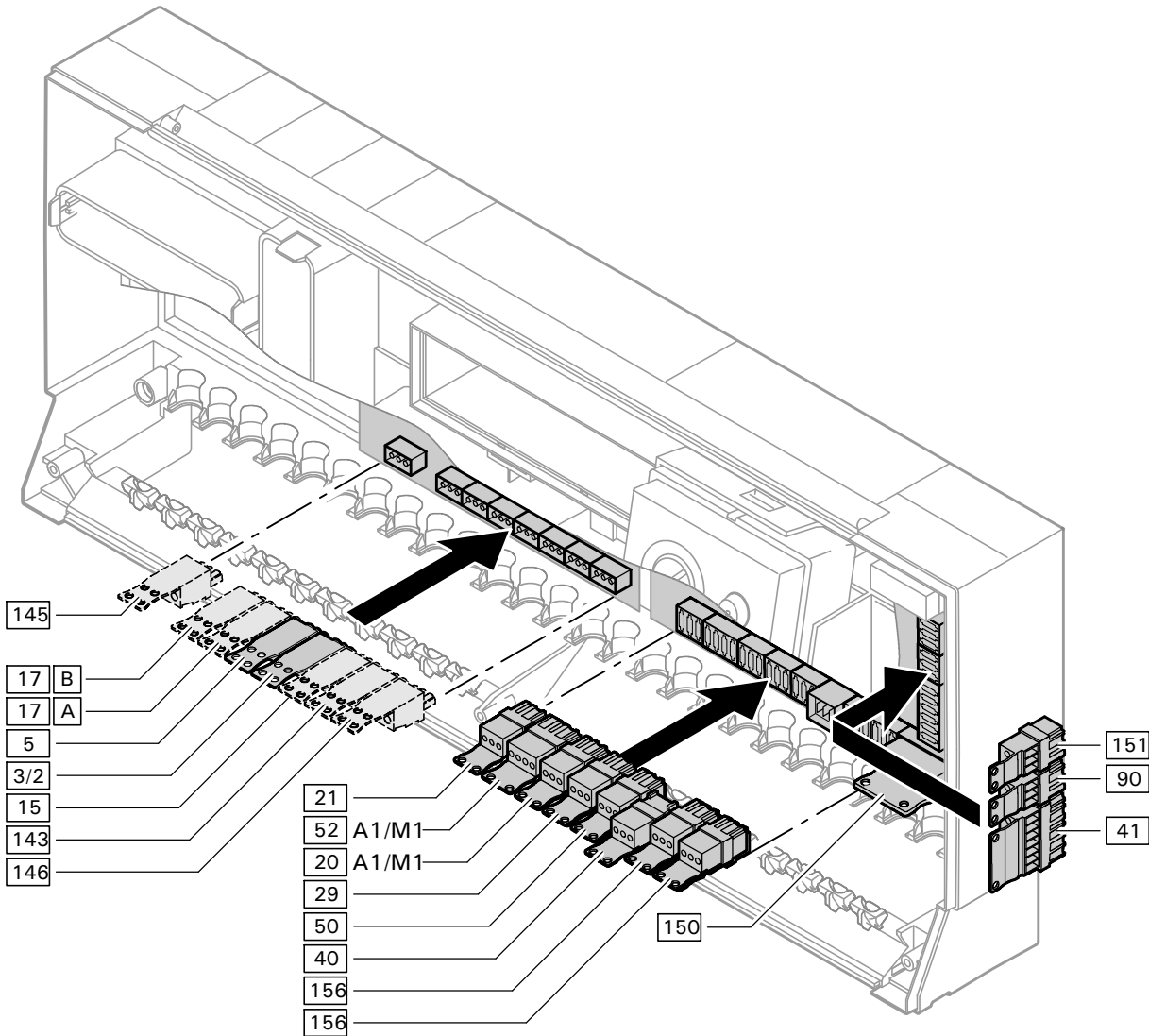


Opening the Control Unit (CM2 only)



1. Remove the control cosmetic cover .
2. Unscrew the screws from the front housing.
3. Swing up the front part of the control housing.
4. Position the stay bar so that it supports the front housing.

Overview of Electrical Connections



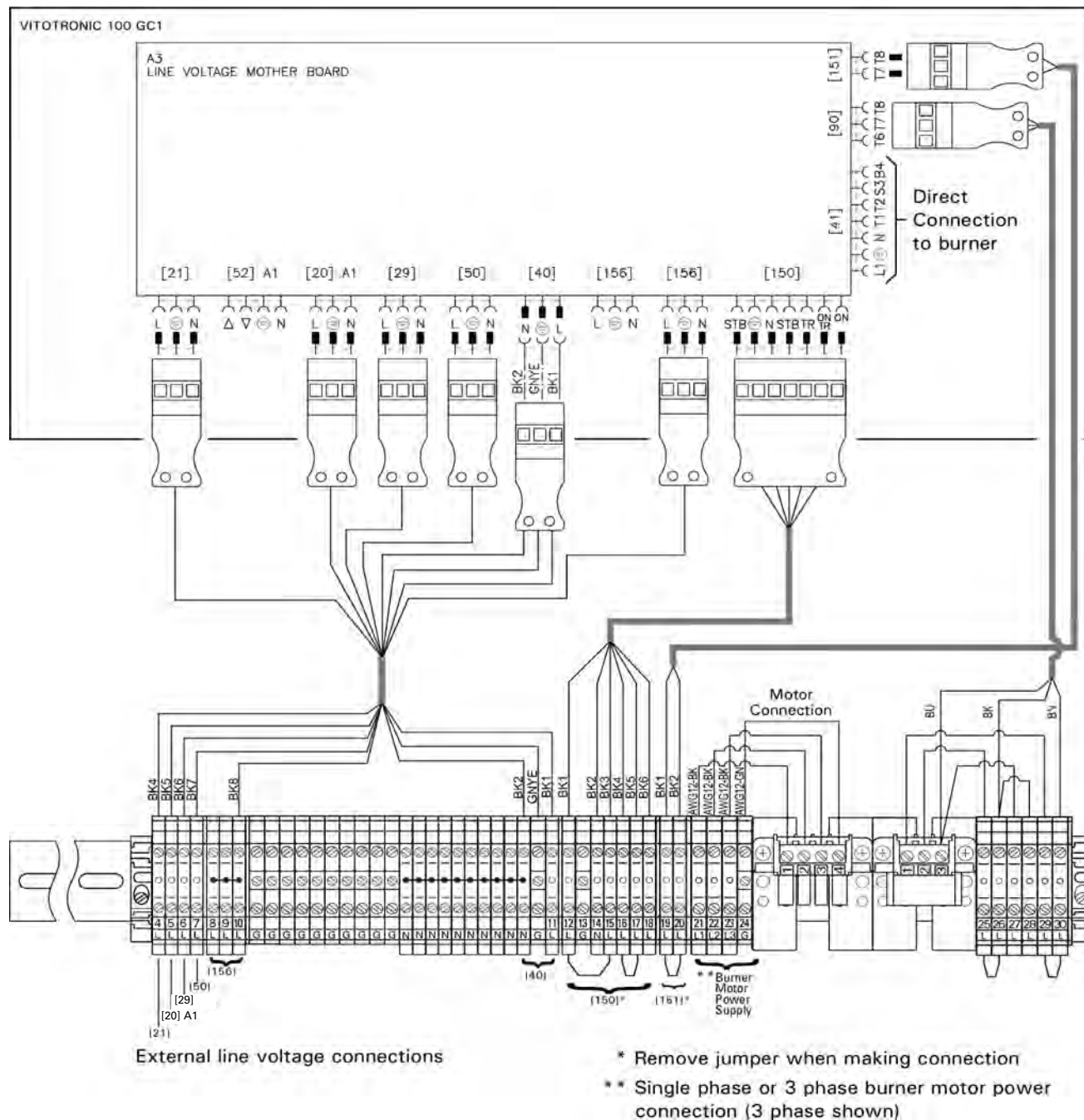
Low voltage connections (motherboard)

- 3 Boiler temperature sensor (KTS)
- 5 DHW tank temperature sensor
- 15 Flue gas temperature sensor
- 17 A Return temperature sensor T1
- 17 B Return temperature sensor T2
- 143 Connection of external equipment
- 145 KM BUS participant
- 146 Connection of external equipment

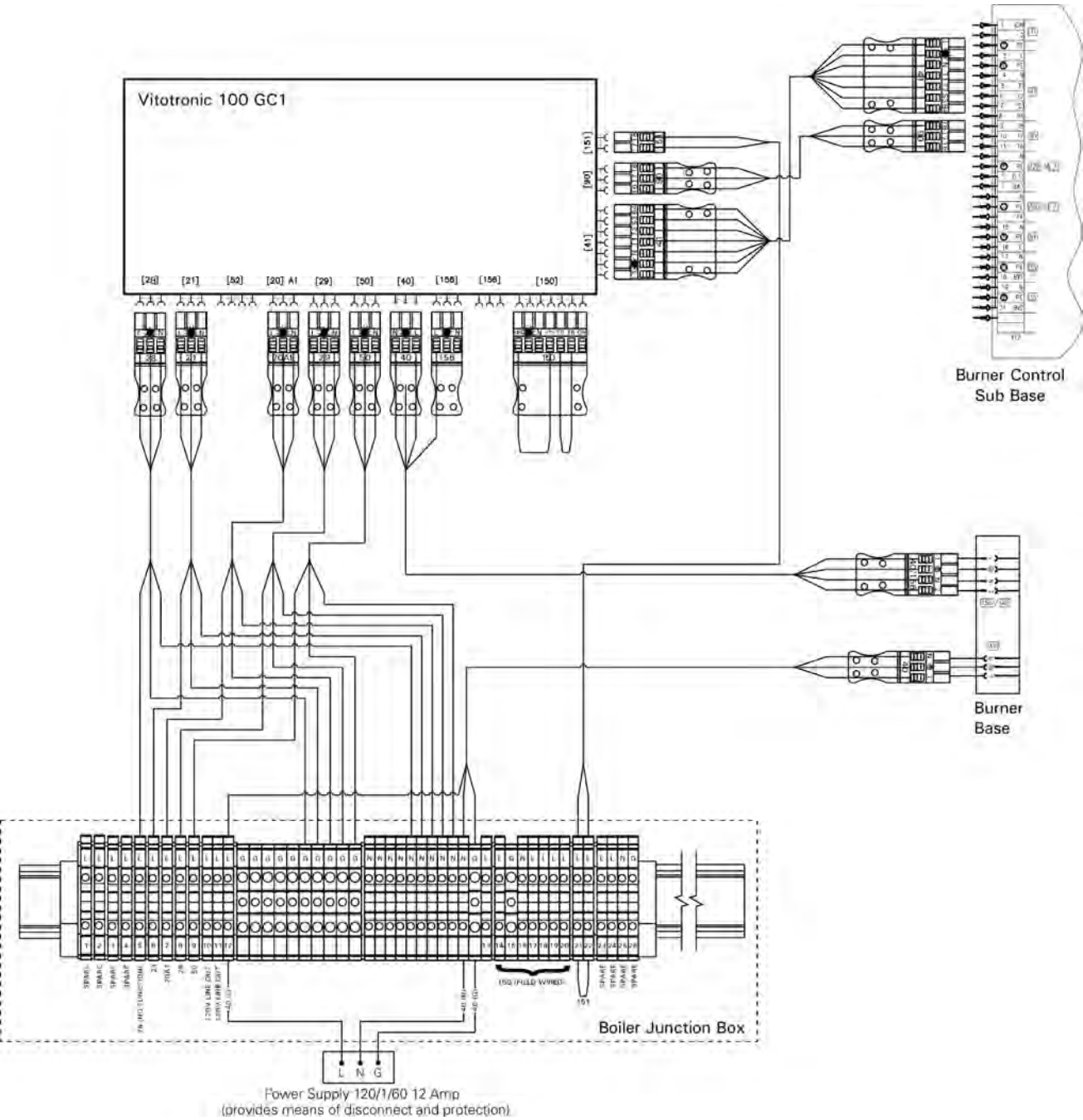
Line voltage connections (motherboard)

- 20 A1 Control output
- 21 DHW pump
- 29 Shunt pump or boiler circuit pump
- 40 Power supply connection
- 41 Burner (1st stage)
- 50 Compiled failure alarm
- 52 A1 Return valve or Isolation/modulating valve
- 90 Burner (2nd stage/modulating)
- 150 Connection of external equipment, e.g. additional safety equipment
- 151 Safety circuit, potential free
- 156 Power supply connection for accessories

Overview of Electrical Connections (VD2/VD2A/CT3 only) *(continued)*

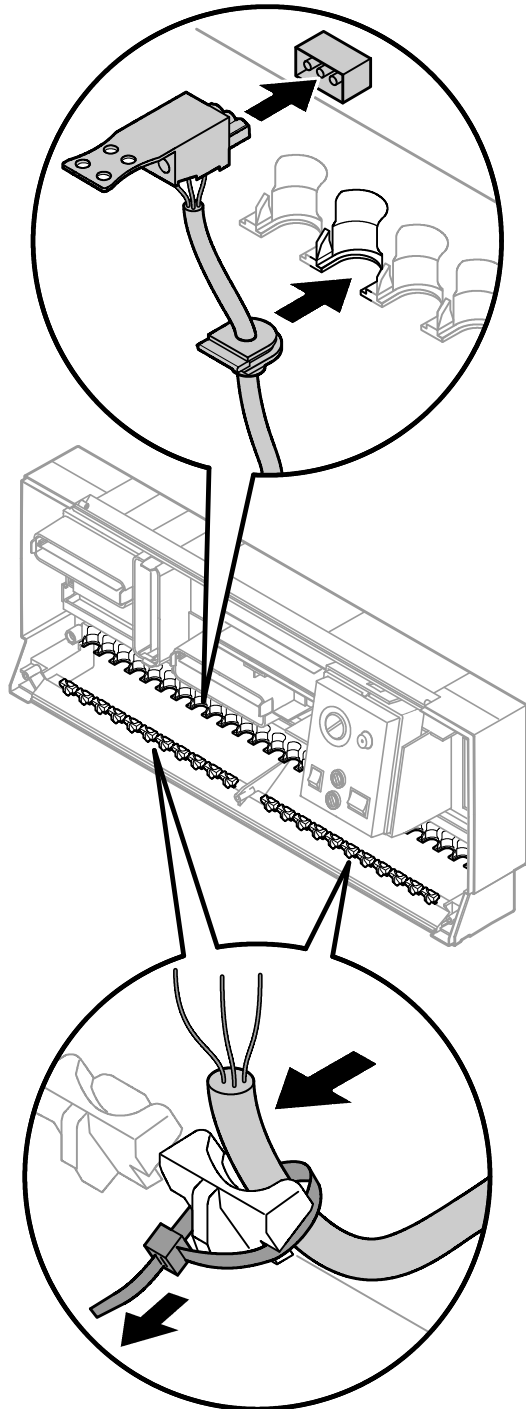


Overview of Electrical Connections (CM2 only) *(continued)*



Routing and Strain Relief of Cables

1. Run the cables from the connection enclosure into the control unit.
2. Apply strain relief to cables (see below).



Cables with moulded strain relief clamp

Connect cable and strain relief clamp.

OR

Fasten cable to the cable lead with cable tie.

Inserting the Boiler Coding Card

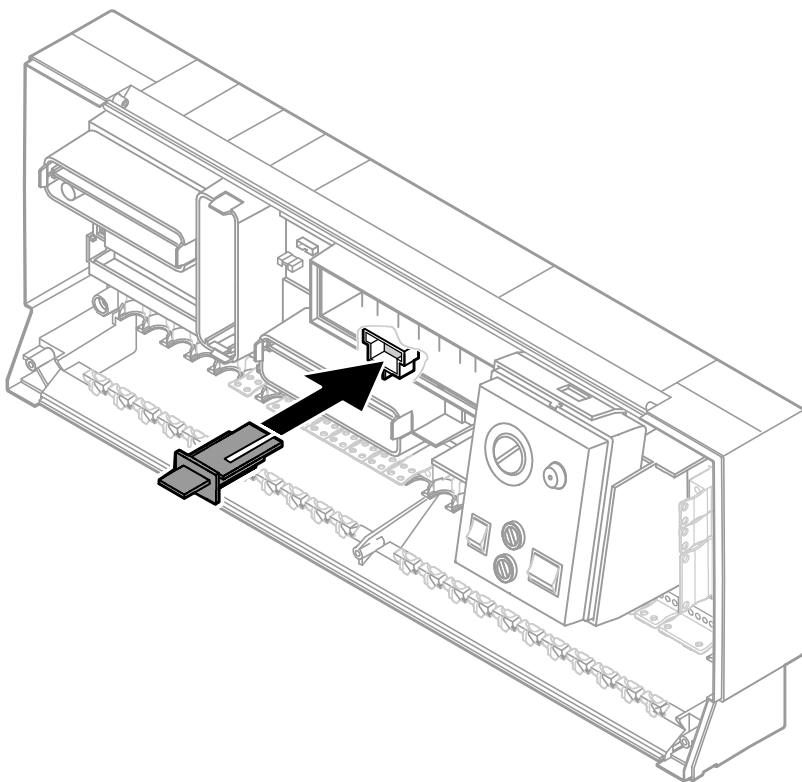


CAUTION

For matching the operation of the control unit to the boiler, the boiler coding card which is supplied as part of the standard delivery of the boiler may be used.

Only use the boiler coding card included with the boiler.

Boiler	Coding card	Part no.
Vitocrossal 300, type CT3	1040	7820 144
Vitorond 200, VD2 / VD2A	1020	7820 142
Vitocrossal 200, CM2	1041	7820 145

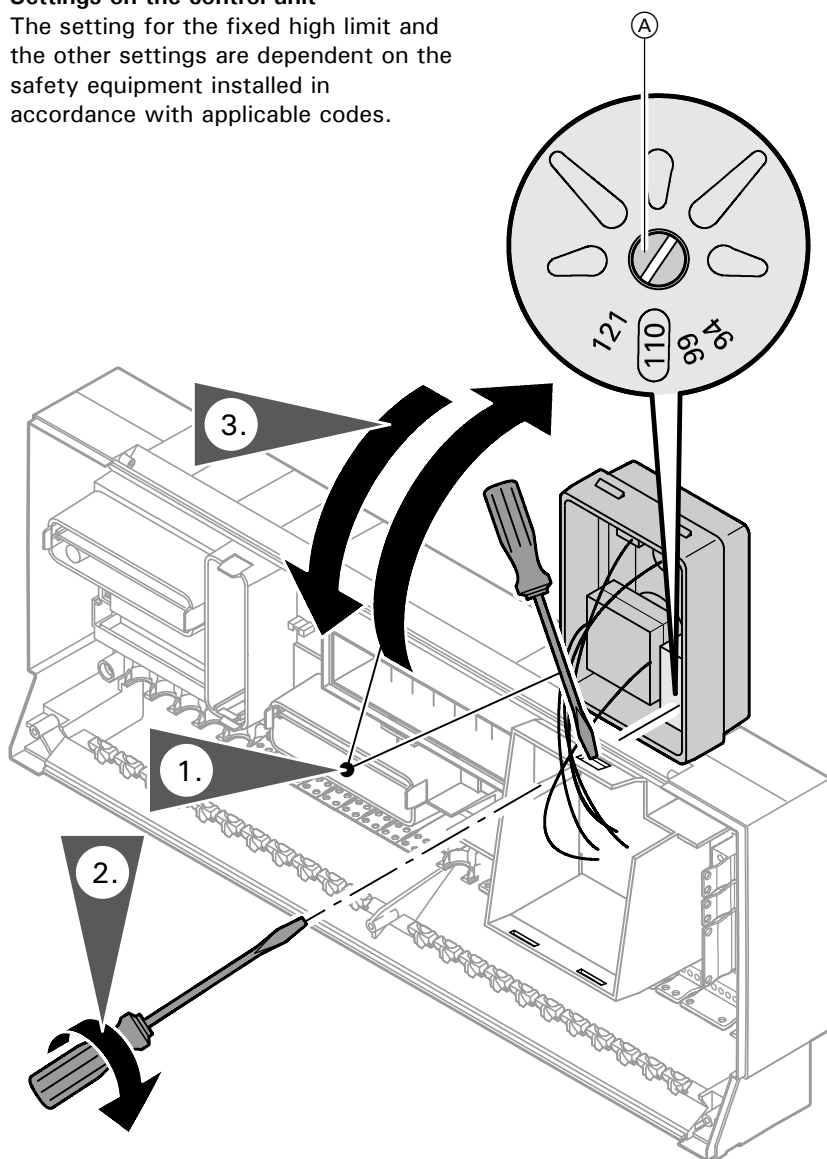


1. Push the boiler coding card through the recess in the cover and insert it in plug-in location "X7".

Setting of the Fixed High Limit (if required)

Settings on the control unit

The setting for the fixed high limit and the other settings are dependent on the safety equipment installed in accordance with applicable codes.



The fixed high limit is supplied with a factory setting of 110°C / 230°F.

- On Vitotronic 100, GC1 for Vitorond 200, VD2 of 110°C / 230°F
- Adjustment to 99°C / 210°F

- On Vitotronic 100, GC1 for Vitocrossal 300, CT3
Vitocrossal 200, CM2 of 99°C / 210°F
- No adjustment

⚠ **Disconnect power to control and burner!**

1. Unclip the fuse box and swing upwards.
2. Turn the slotted screw on the rear of the fixed high limit until the slot points to 99°C / 210°F (once adjusted, the fixed high limit **cannot** be reset to 110°C / 230°F).
3. Re-fit the fuse box.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Setting of the Adjustable High Limit (if required)

The adjustable high limit is supplied with a factory setting of 95°C / 203°F
Adjustment to 100°C / 212°F

1. Disconnect power to control and burner.
2. Using a suitable screwdriver, lever out and remove the selector knob "A" behind the hinged cover.
3. Using a pair of pointed pliers, break off the cams identified by the shaded areas in the Fig. from the stop dial.

(A)	75 to 100°C 167 to 212°F
-----	-----------------------------

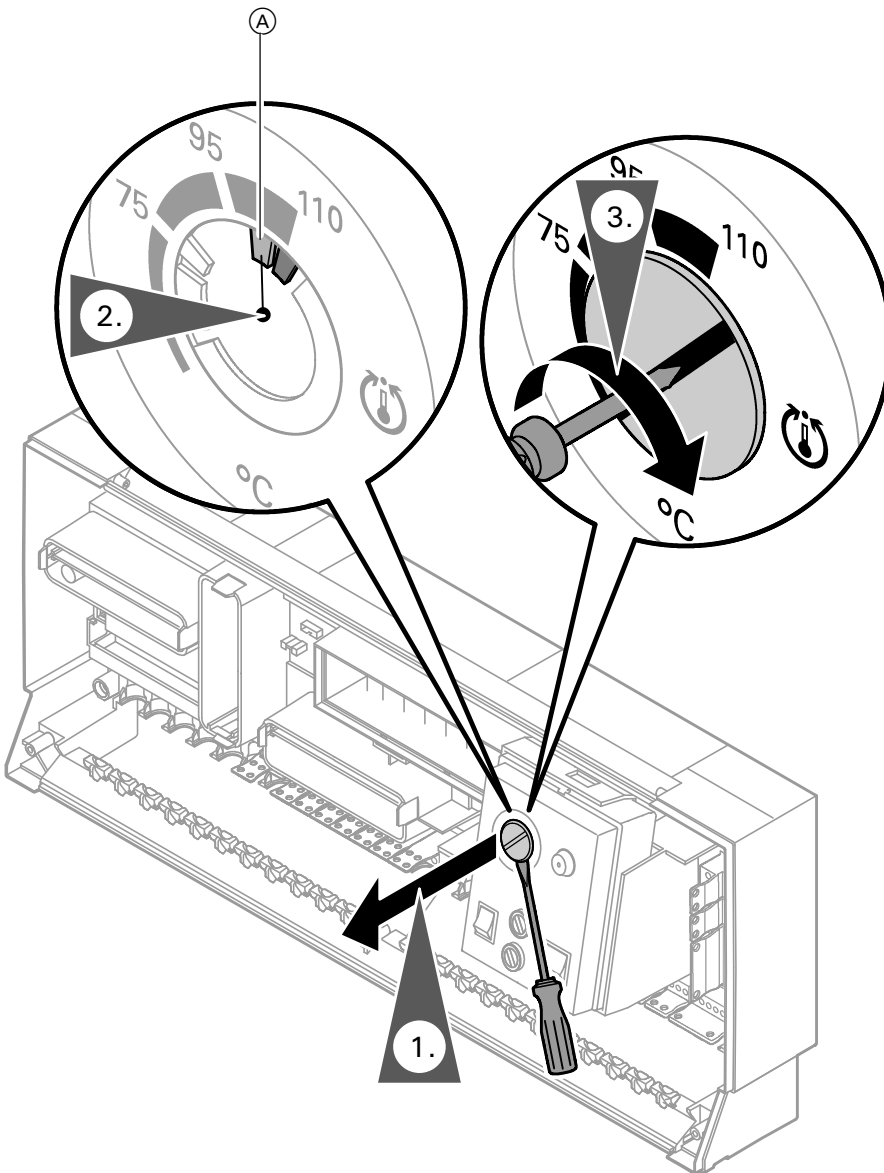
4. Fit the selector knob "A" so that the marking is in the centre of the selected range.

IMPORTANT

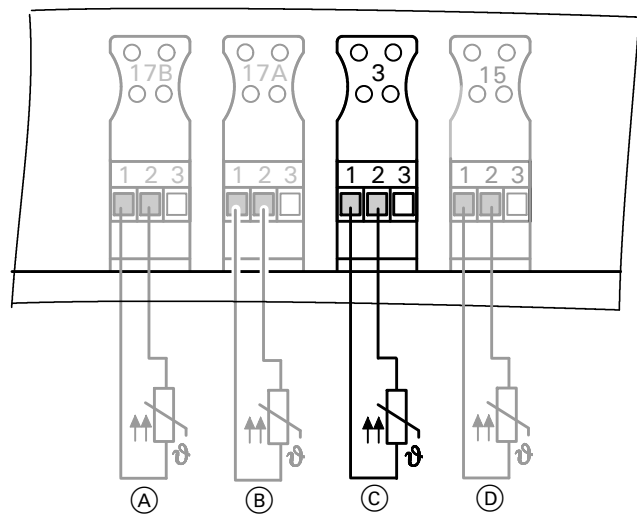
Note the setting of coding address "06"!

WARNING

If the system is operated in conjunction with a domestic hot water tank, ensure that the maximum permissible domestic hot water temperature is not exceeded. If necessary, install a suitable safety device for this purpose.

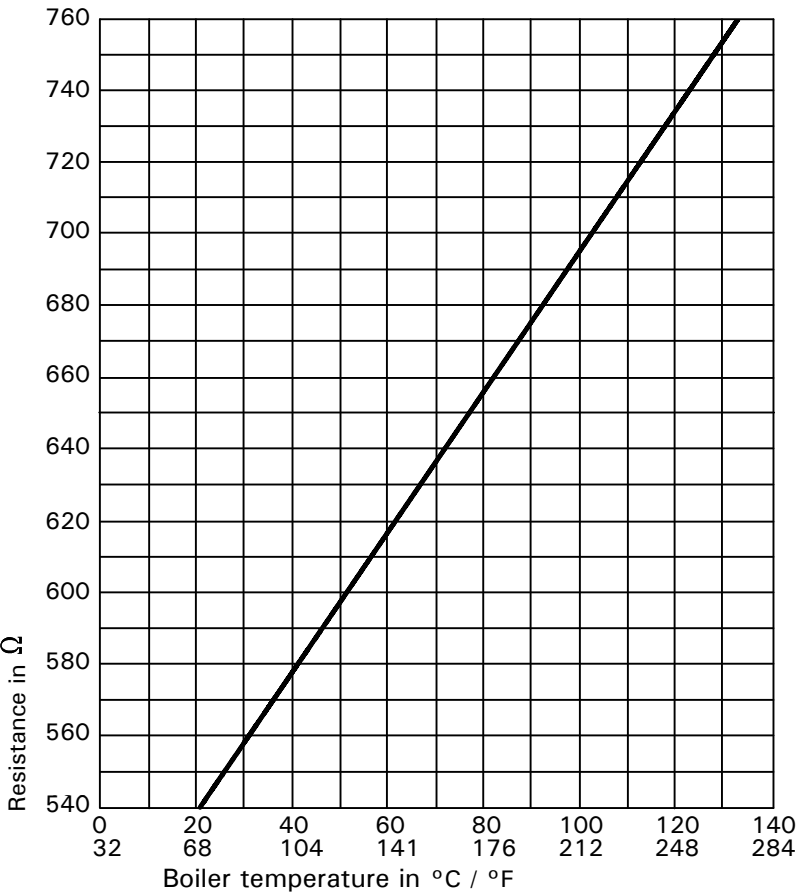
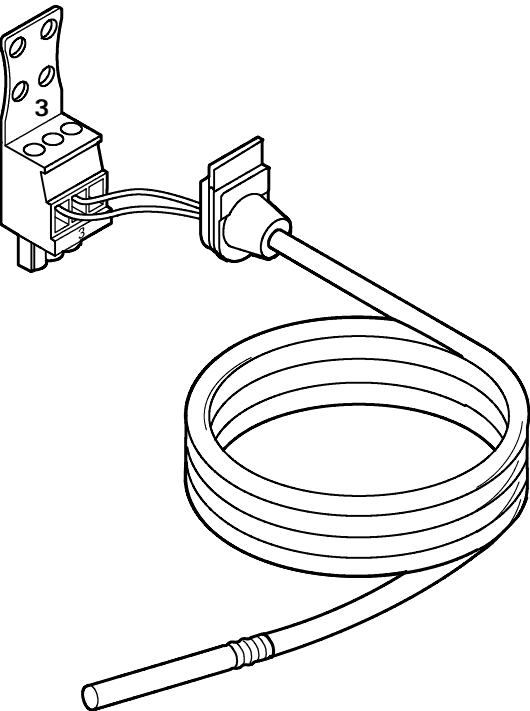


Sensor Connection



- Ⓐ Temperature sensor T2
- Ⓑ Temperature sensor T1
- Ⓒ Boiler temperature sensor
- Ⓓ Flue gas temperature sensor

Connection of the Boiler Temperature Sensor



Electrical connection

See page 35.

The sensor measures the boiler water temperature of the boiler.

The boiler temperature sensor is installed at the same time as the boiler insulation.

Check the sensor

1. Disconnect plug 3 in the terminal compartment.
2. Measure resistance of sensor at terminals "1" and "2" of the plug or "2" and "3" (if a second DHW tank temperature sensor is connected).

Boiler water temperature in °C / °F	Resistance in Ω
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

Degree of protection: IP 32

Ambient temperature

during operation:

0 to + 130°C

32 to + 266°F

during storage and transport:

-20 to + 70°C

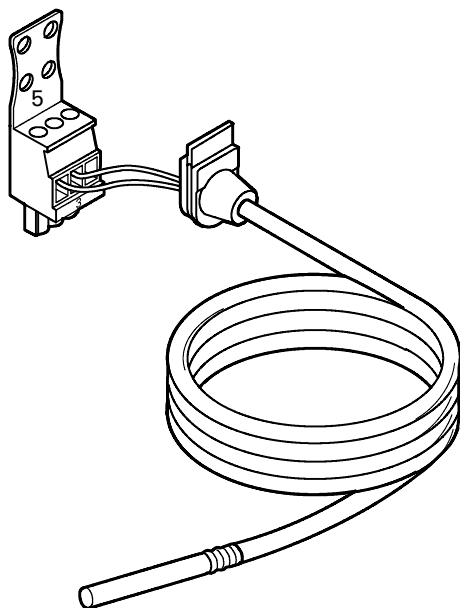
- 4 to + 158°F

Electrical connection

The sensors are ready to plug in. Insert the boiler temperature sensor in socket "3" of the boiler control.

Connection of the DHW Tank Temperature Sensor

The sensor measures the domestic hot water tank temperature.



Heating systems with domestic hot water heating (single-boiler systems only)

1. Install the DHW tank temperature sensor.



See installation instructions for domestic hot water tank

Please note:

When installing the sensor in DHW tanks of other makes, make sure that the sensor is pressed against the sensor well of the DHW tank by means of a suitable device.

2. Ensure that the **maximum** permissible domestic hot water temperature is not exceeded. If necessary, install a suitable safety device for this purpose.

Heating systems without domestic hot water heating

Do **not** connect the DHW tank temperature sensor.

Electrical connection

See page 35.

The sensor measures the boiler water temperature of the boiler.

The boiler temperature sensor is installed at the same time as the boiler insulation.

Check the sensor

1. Disconnect plug [5] in the terminal compartment.
2. Measure resistance of sensor at terminals "1" and "2" of the plug or "2" and "3" (if a second DHW tank temperature sensor is connected).

DHW tank temperature in °C / °F	Resistance in Ω
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

Degree of protection: IP 32

Ambient temperature

during operation:

0 to + 130°C

32 to + 266°F

during storage and transport:

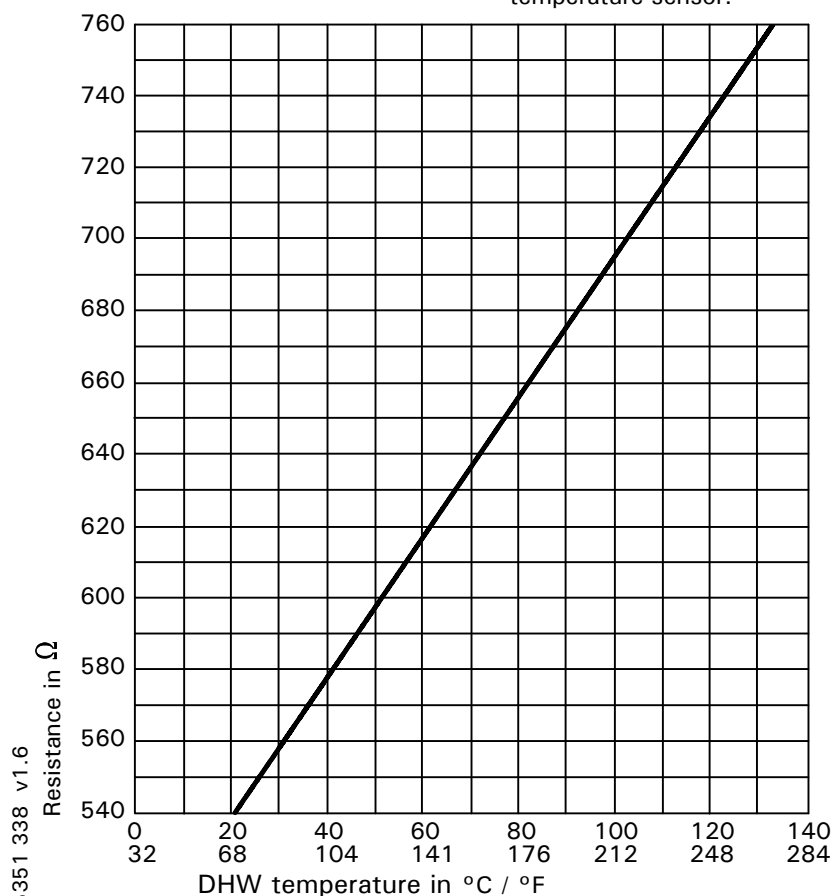
-20 to + 70°C

- 4 to + 158°F

Electrical connection

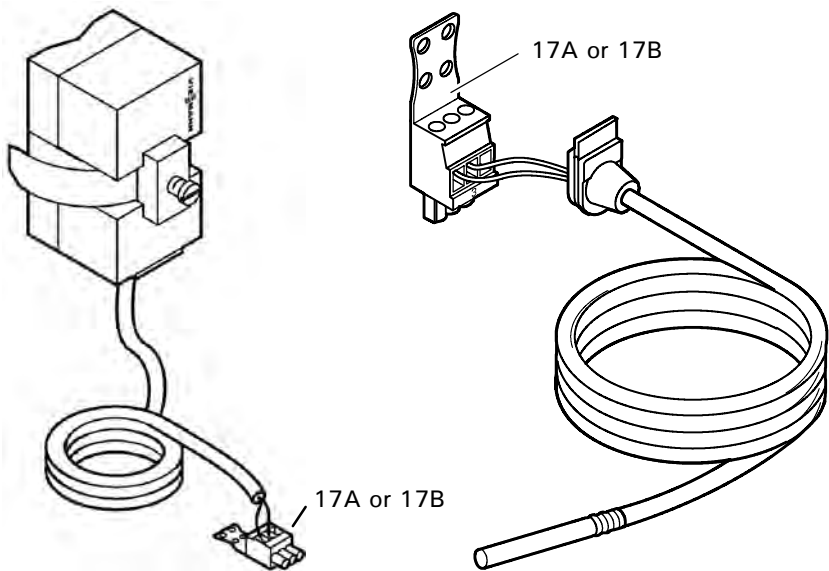
The sensors are ready to plug in.

Insert the DHW temperature sensor in socket "5" of the boiler control.



Connection of the Return Temperature Sensor

Strap-on temperature sensor and immersion temperature sensor



For measuring the boiler return and return temperature.

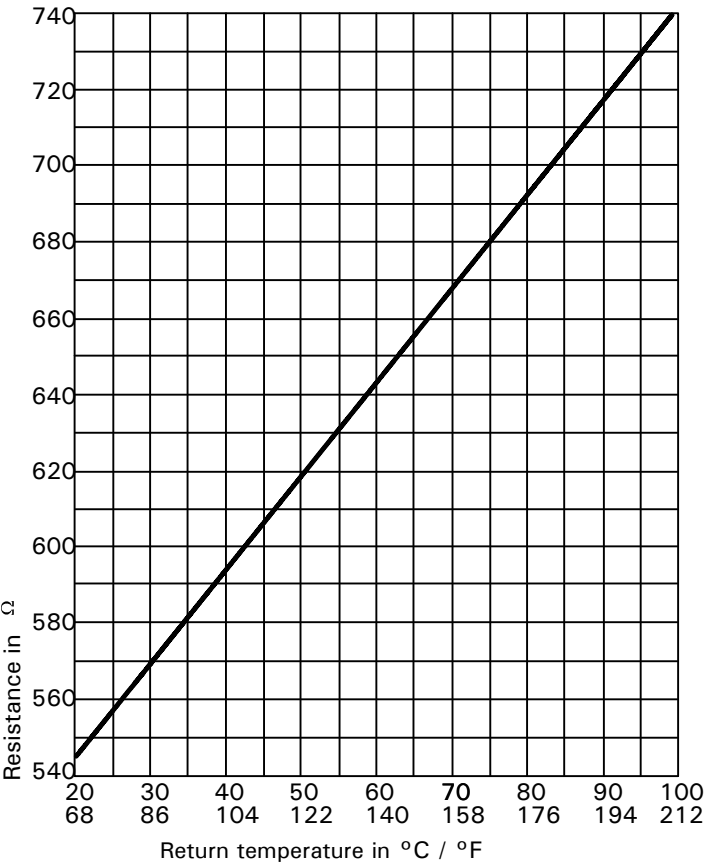
Electrical connection
The sensor is inserted in socket "17A" or "17B" on the boiler control.

- Check the sensor**
1. Disconnect plug 17A or 17B in the terminal compartment of the boiler control.
 2. Measure resistance of sensor at terminals "1" and "2" of the plug.

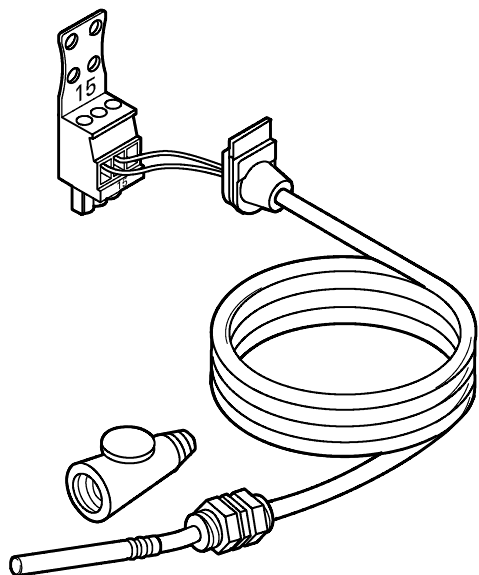
Return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature during operation: 0 to + 100°C
32 to + 212°F
during storage and transport: -20 to + 70°C
-4 to + 158°F



Connection of the Flue Gas Temperature Sensor (VD2/VD2A/CT3 only)



The sensor measures the flue gas temperature and monitors the selected limit value.

Electrical connection

The sensor is inserted in socket "15" on the control unit.

Check flue gas temperature sensor

1. Disconnect plug **15** in the terminal compartment.
2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Flue gas temperature in °C / °F	Resistance in Ω
80 / 176	650
160 / 320	800
200 / 392	880

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

Degree of protection: IP 60

Ambient temperature

during operation:

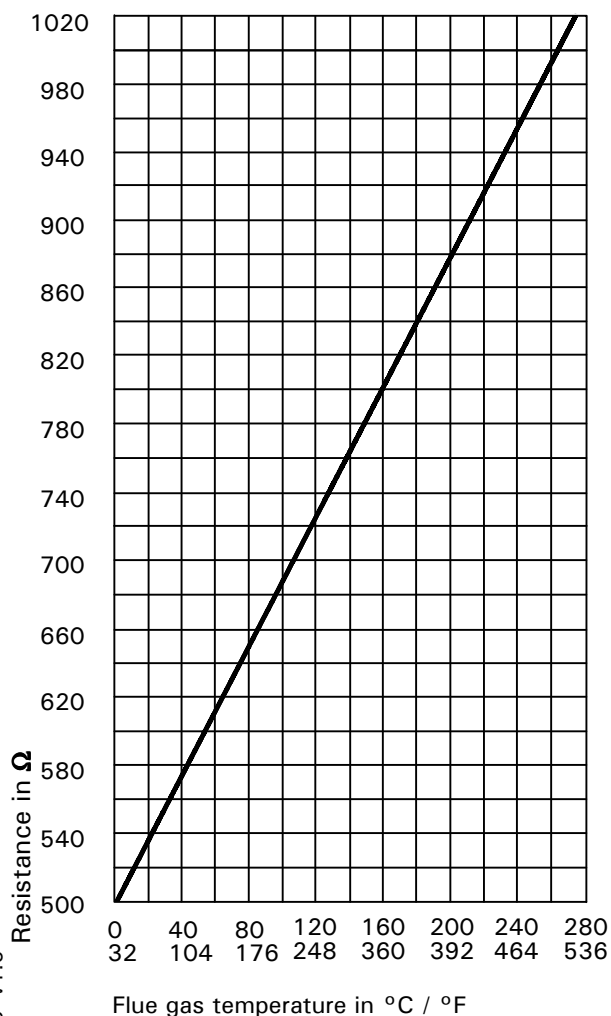
0 to + 600°C

32 to + 1112°F

during storage and transport:

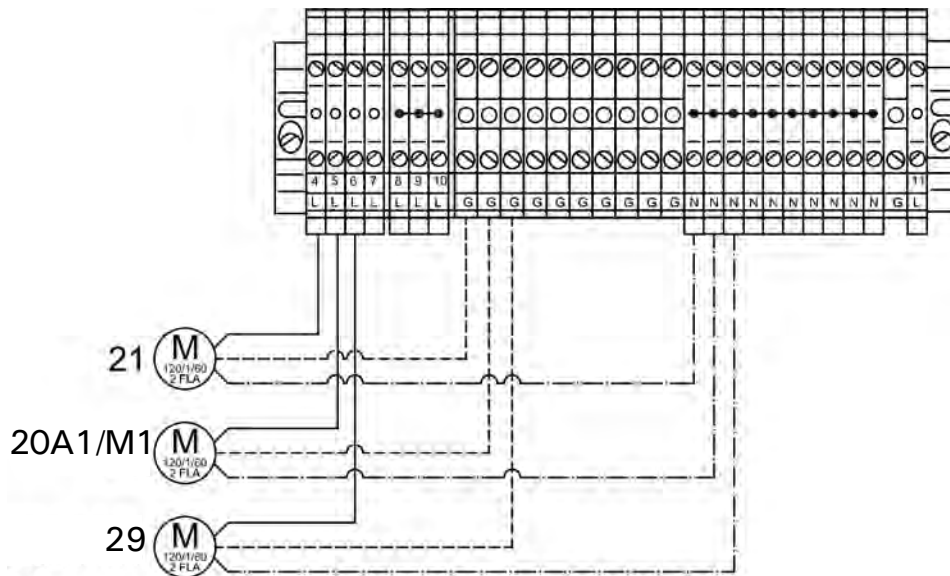
-20 to + 70°C

- 4 to + 158°F



Connection of the Pumps (VD2/VD2A/CT3 only)

Available pump connections



- 20 A1/M1 Heating circuit high temperature (without mixing valve)
Terminals 5 - L, - G, - N
- 21 Circulation pump for heating up the domestic hot water tank -
Terminals 4 - L, - G, - N
- 29 Shunt pump, boiler circuit pump
Terminals 6 - L, - G, - N.



Install pumps: see manufacturer's instructions.

120 VAC pumps

Note:

The maximum power consumption of all pumps is 4A .

Rated current: max. 2 FLA

Recommended connection cable: AWG 14

Use contactor for pumps with higher current rating

Connect the 3-wire cable from the pump to the corresponding terminals.

240 VAC or 3 PH pumps

Please note:

Use contactor and/or motor starter to power pump.

For activating the contactor:

Rated current: max. 2 FLA

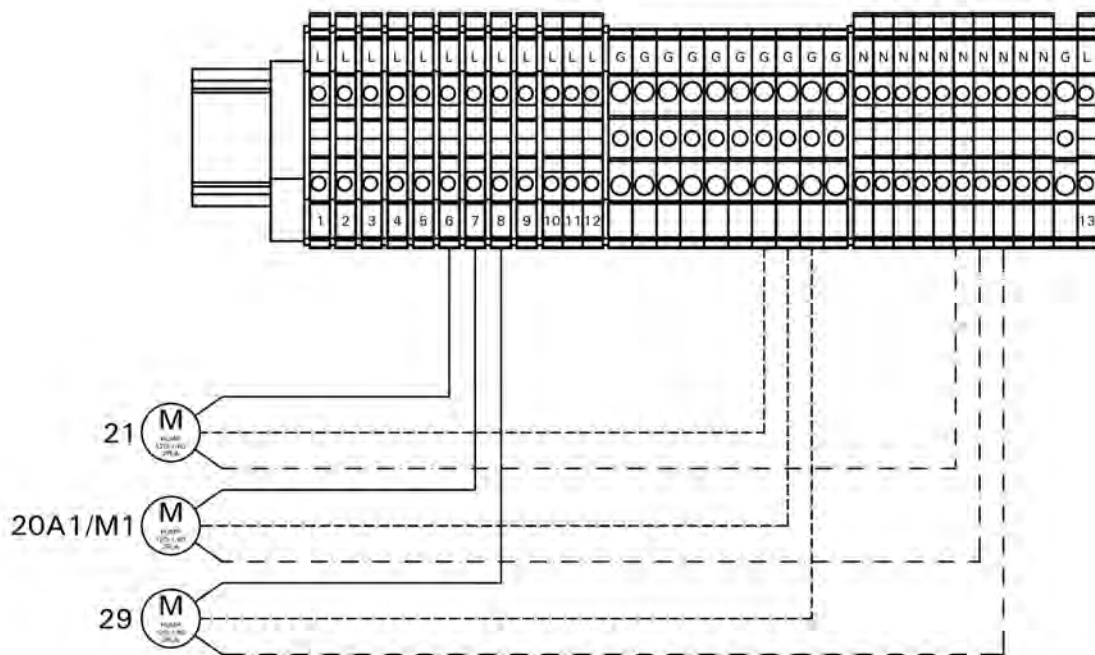
Recommended connection wire size: AWG 14

Please ensure that all connections and wire sizes comply with local and national codes.

1. Select the contactor and the connecting wire in accordance with the rating of the pump that is to be connected.
2. Connect pump and power supply to the contactor.
3. Connect contactor coil to the corresponding terminals.

Connection of the Pumps (CM2 only)

Available pump connections



- 20 A1/M1 Heating circuit high temperature (without mixing valve)
Terminals 7 - L, - G, - N
- 21 Circulation pump for heating up the domestic hot water tank -
Terminals 6 - L, - G, - N
- 29 Shunt pump, boiler circuit pump
Terminals 8 - L, - G, - N.



Install pumps: see
manufacturer's
instructions.

120 VAC pumps

Note:

The maximum power consumption
of all pumps is 4A .

Rated current: max. 2 FLA
Recommended connection
cable: AWG 14

Use contactor for pumps with higher
current rating

Connect the 3-wire cable from the
pump to the corresponding terminals.

240 VAC or 3 PH pumps

Please note:

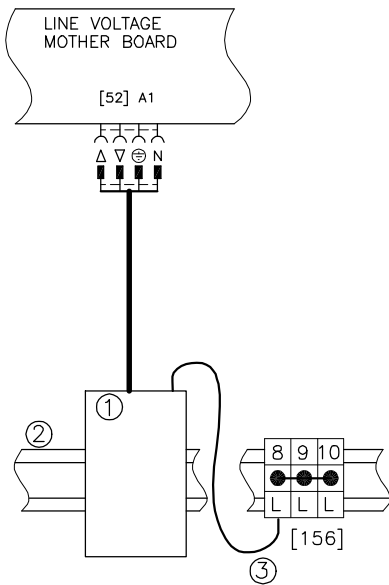
Use contactor and/or motor starter
to power pump.

For activating the contactor:
Rated current: max. 2 FLA
Recommended connection
wire size: AWG 14

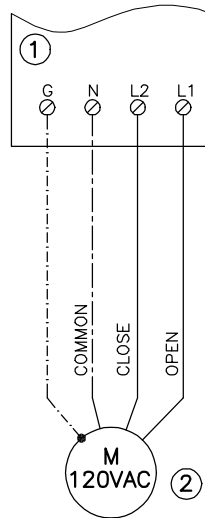
Please ensure that all connections
and wire sizes comply with local and
national codes.

1. Select the contactor and the
connecting wire in accordance
with the rating of the pump that
is to be connected.
2. Connect pump and power supply
to the contactor.
3. Connect contactor coil to the
corresponding terminals.

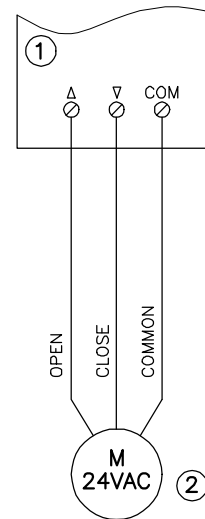
Connection of Boiler Return Mixing Valve or Isolation/Modulating Valve (VD2/VD2A/CT3 only)



- ① 120V or 24V Valve Adaptor
- ② DIN rail in connection enclosure
- ③ [156] Terminals



- ① 120V Valve Adaptor
- ② 120V valve actuator



- ① 24V Valve Adaptor
- ② 24V valve actuator

120V Valve Adaptor

Rated voltage: 120 VAC
 Rated current: max. 0.1 FLA
 Recommended connection
 wire size: AWG 14
 Part No. 7134 560

24V Valve Adaptor

Rated voltage: 24 VAC
 Rated current: max. 0.15 FLA
 Recommended connection
 wire size: AWG 14
 Part No. 7134 559

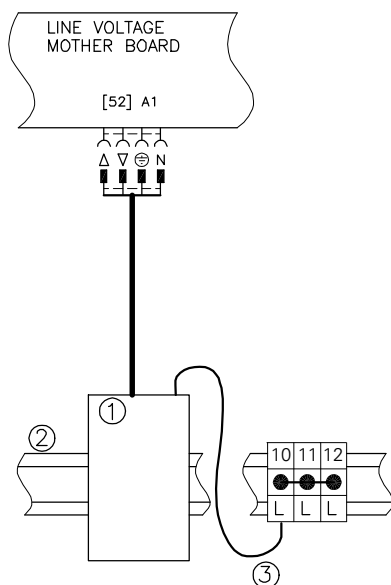
Operating time:

5 to 199 sec. selected via coding
 address "40".

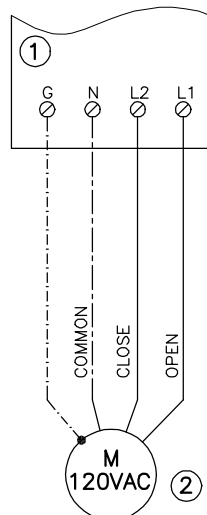
1. Disconnect power to control.
2. Install 120V or 24V Valve Adaptor on DIN rail inside connection enclosure.
3. Insert the plug [52] into socket [52] on the control.
4. Fasten cable with tie (see page.37).
5. Connect black wire of the adaptor to connection [156] on the DIN rail
 - Terminal 8,9 or 10.
6. Connect valve actuator wires to the adaptor terminals as shown on figures.

Connection of Boiler Return Mixing Valve or Isolation/Modulating Valve

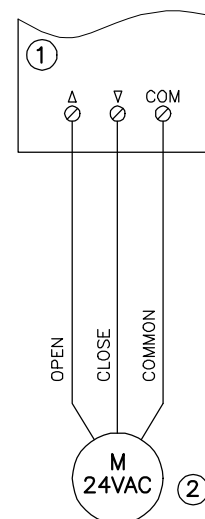
(CM2 only)



- ① 120V or 24V Valve Adaptor
- ② DIN rail in connection enclosure
- ③ 120V L out power supply



- ① 120V Valve Adaptor
- ② 120V valve actuator



- ① 24V Valve Adaptor
- ② 24V valve actuator

120V Valve Adaptor

Rated voltage: 120 VAC
 Rated current: max. 0.1 FLA
 Recommended connection
 wire size: AWG 14
 Part No. 7511367

24V Valve Adaptor

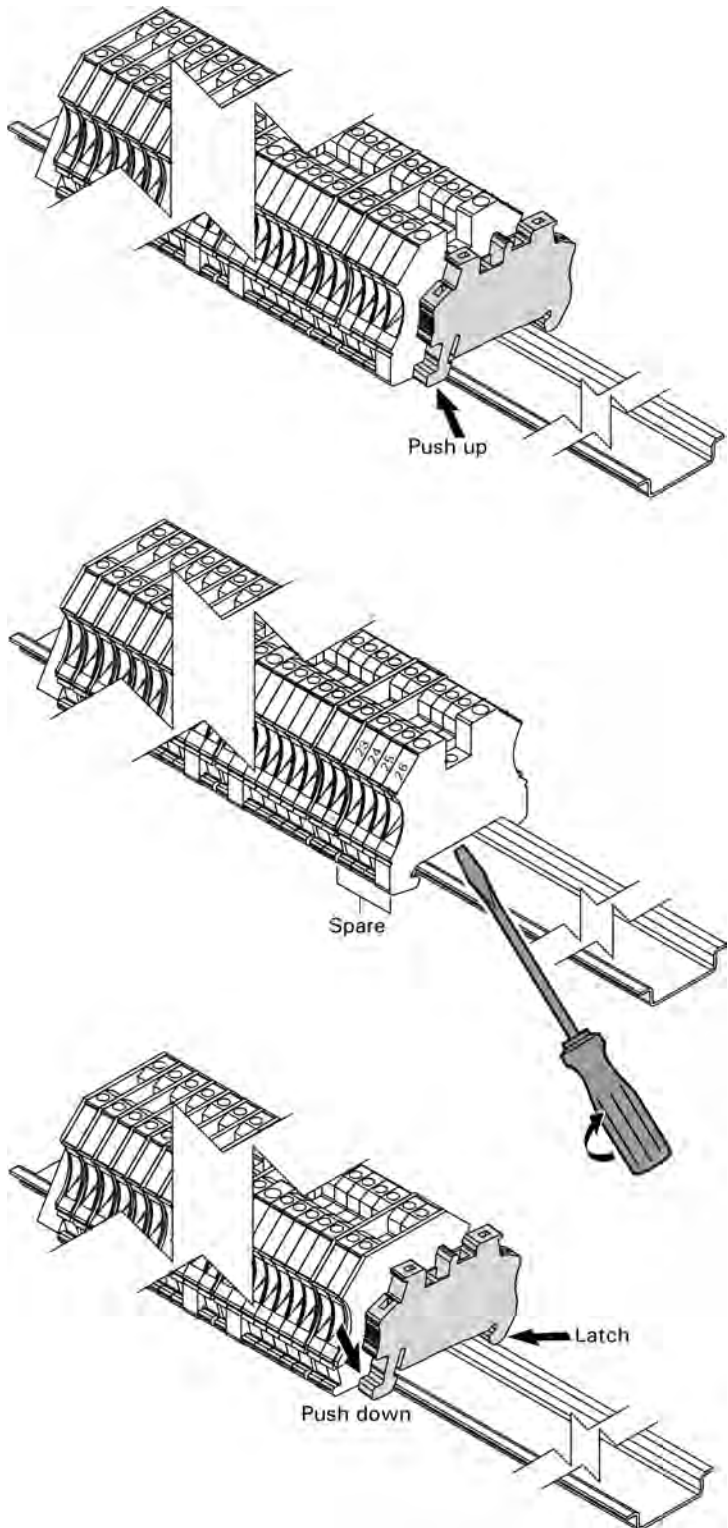
Rated voltage: 24 VAC
 Rated current: max. 0.15 FLA
 Recommended connection
 wire size: AWG 14
 Part No. 7511366

Operating time:

5 to 199 sec. selected via coding
 address "40".

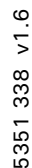
1. Disconnect power to control.
2. Install 120V or 24V Valve Adaptor on DIN rail inside connection enclosure.
3. Insert the plug [52] into socket [52] on the control.
4. Fasten cable with tie (see page.37).
5. Connect black wire of the adaptor to connection 120V L out the DIN rail
 - Terminals 10,11 or 12.
6. Connect valve actuator wires to the adaptor terminals as shown on figures.

Making Space for Accessory Adaptors on the DIN Rail (CM2 only)



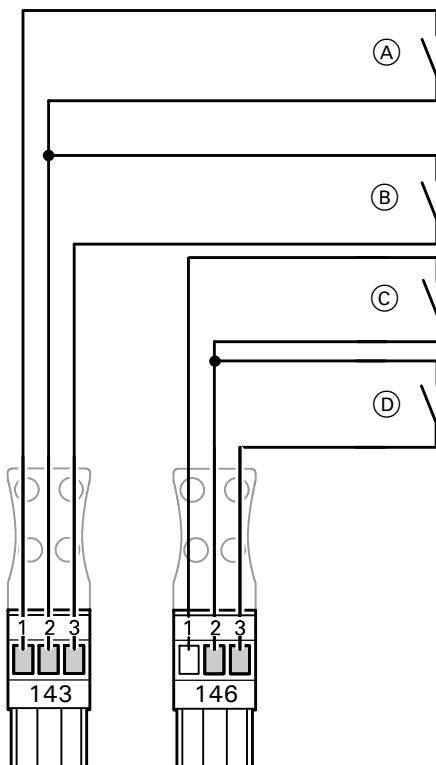
1. Push up on the bottom front of the DIN rail clamp to remove and set aside.
2. Using a flat head screwdriver, remove the 4 'spare' DIN terminals 23, 24, 25 and 26 one at a time. Place the screwdriver between the rail and the base of the terminal and turn the screwdriver clockwise. Discard the removed terminals.
3. Re-install the DIN rail clamp by hooking the latch of the clamp around the top of the rail and then push down on the front of the clamp.

Note: See separate Installation Instructions for accessory adaptors.



Connection of External Controls

Operation with two-stage burner



(A) Switch on 1st stage burner
Connect dry contact at terminals "1" and "2" of the plug **143**.

Contact closed:
The 1st stage burner is switched on. The 2nd stage burner is only switched on to maintain the minimum temperature (not with Vitocrossal 300). The boiler water temperature is limited by the electronic maximum temperature limit (coding address "06") if this is set below the value preset on the mechanical adjustable high limit "0".

Contact open:
The 1st stage burner is switched off.

Dry contacts of the building automation system:

1st stage burner ON

2nd stage burner ON

External changeover of staged/modulating burners

Boiler activation, isolation valve open or closed (on multi-boiler system only)

(B) Switch on 2nd stage burner
Connect dry contact at terminals "2" and "3" of the plug **143**.

Contact closed:
Both burner stages are switched on. The boiler water temperature is limited by the electronic maximum temperature limit (coding address "06") if this is set below the value preset on the mechanical adjustable high limit "0". The 2nd stage burner is switched off 2 K sooner.

Contact open:
The 1st and 2nd stage burner are switched off.

(C) External changeover of staged/modulating burners
Connect dry contact at terminals "1" and "2" of the plug **146**.

Contact closed:
Modulating operation.

Contact open:
Two-stage operation. Coding "02: 2" (modulating burner) must be set.

Note:
Even if contact is closed, scanning the type of burner will continue to display "modulating".

(D) Boiler activation, isolation valve open or closed
Connect dry contact at terminals "2" and "3" of the plug **146**.

Contact closed:
First, the preheat function for follow-up boilers is activated (coding address "2b"). When the preheat function finishes, the minimum temperature is maintained for the boiler (not with Vitocrossal 300), and the burner stages can be switched externally. The boiler water temperature is limited by the preset electronic maximum temperature limit or via the mechanical adjustable high limit. The setpoint value is selected via the coding address "9b".

Contact open:
The isolation valve is closed after approximately 5 minutes (coding address "2C"). External override of the burner stages is not possible, and no minimum temperature is maintained.

Connection of External Controls *(continued)*

Operation with two-stage burner

Settings on the control unit

The settings for the fixed high limit and the other settings are dependent on the safety equipment installed in accordance with applicable codes.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Single-boiler systems:

Coding "01: 1"
(factory setting)

When a building automation system is connected, only the connections on plug [143] are required. The DHW tank control unit is activated when the DHW tank temperature sensor is connected. The boiler water temperature must be set to the minimum value.

Multi-boiler systems:

Set coding "01: 3"

When a building automation system is connected, the connections on plugs [143] and [146] are required. The DHW tank temperature and the load-dependent cascade control must be controlled through the building automation system.

CAUTION

The boiler activation contact is essential on multi-boiler systems. The contact on the lead boiler must be constantly closed.

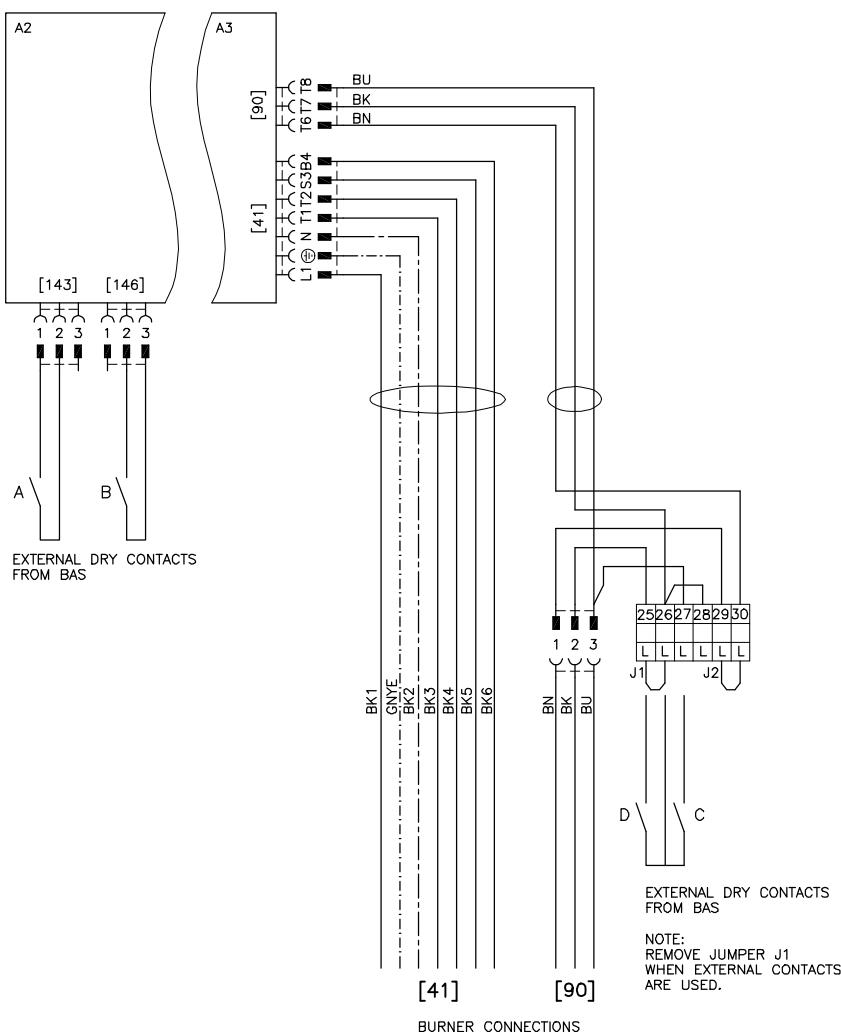
Connection of External Controls (VD2/VD2A only) *(continued)*

Modulating boilers – operation with external modulation controller *(continued)*

1st stage burner [41] from Vitotronic 100.

Plug [90] from Vitotronic 100 via modulation controller (BAS).

On the building automation unit with modulation controller set the minimum temperatures 5°C / 9°F above the minimum boiler water temperature of the boiler.



EXTERNAL DRY CONTACTS:
A– BURNER ACTIVATION
1ST STAGE ON
B– BOILER ISOLATION VALVE OPEN
(ON MULTI BOILER SYSTEM ONLY)
C– MODULATION UP
D– MODULATION DOWN

Boiler activation, isolation valve open or closed

Connect dry contact at terminals "2" and "3" of the plug [146].

Contact closed:

First, the preheat function for follow-up boilers is activated (coding address "2b").

When the preheat function finishes, the minimum temperature is maintained for the boiler, and the burner stages/modulation can be switched externally.

The boiler water temperature is limited by the preset maximum boiler water temperature or via the mechanical adjustable high limit. The set-point value is selected via the coding address "9b".

Contact open:

The isolation valve is closed after approx. 5 minutes (coding address "2C").

External override of the burner stages is not possible, and no minimum temperature is maintained.

Switch on 1st stage burner (basic load)

Connect dry contact at terminals "1" and "2" of the plug [143].

Contact closed:

The 1st stage burner is switched on. The full load is only switched on to maintain the minimum temperature (not with Vitocrossal 300). The boiler water temperature is limited by the electronic maximum temperature limit (coding address "06") if this is set below the value preset on the mechanical adjustable high limit "0".

Contact open:

The 1st stage burner is switched off.

Connection of External Controls (VD2/VD2A only) *(continued)*

Modulating boilers – operation with external modulation controller


Settings on the control unit

The settings for the fixed high limit and the other settings are dependent on the safety equipment installed in accordance with applicable codes.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190



Single-boiler systems:

Coding "01: 1"
(factory setting)

When a building automation system is connected, only the connections on plug  are required. The DHW tank control unit is activated when the DHW tank temperature sensor is connected. The boiler water temperature must be set to the minimum value.

Multi-boiler systems:

Set coding "01: 3"

When a building automation system is connected, the connections on plugs  and  are required. The DHW tank temperature and the load-dependent cascade control must be controlled through the external building automation system.

CAUTION

The boiler activation contact is essential on multi-boiler systems. The contact on the lead boiler must be constantly closed.

Connection of External Controls (CT3 only) *(continued)*

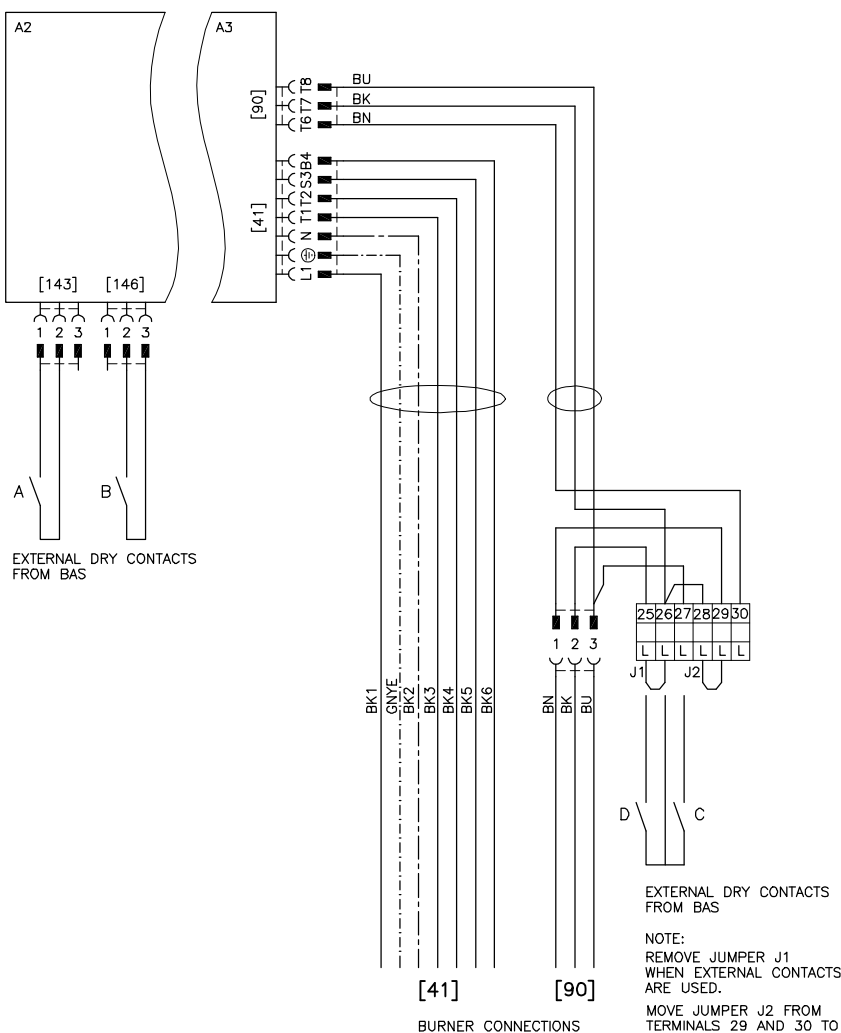
Vitocrossal 300 – operation with external modulation controller

1st stage burner [41] from Vitotronic 100.

Connection [90] from Vitotronic 100 has no function.

Connection [90] from building automation system to the burner.

1st stage burner activated by the modulation controller via connection [146].



EXTERNAL DRY CONTACTS:
A– BURNER ACTIVATION
1ST STAGE ON
B– BOILER ISOLATION VALVE OPEN
(ON MULTI BOILER SYSTEM ONLY)
C– MODULATION UP
D– MODULATION DOWN

Boiler activation, isolation valve open or closed

Connect dry contact at terminals "2" and "3" of the plug [146].

Contact closed:

First, the preheat function for follow-up boilers is activated (coding address "2b").

When the preheat function finishes, the burner stages/modulation can be switched externally.

The boiler water temperature is limited by the preset maximum boiler water temperature or via the mechanical adjustable high limit.

The set-point value is selected via the coding address "9b".

Contact open:

The isolation valve is closed after approximately 5 minutes (coding address "2C").

External override of the burner stages is not possible, and no minimum temperature is maintained.

Switch on 1st stage burner (basic load)

Connect dry contact at terminals "1" and "2" of the plug [143].

Contact closed:

The 1st stage burner is switched on. The boiler water temperature is limited by the electronic maximum temperature limit (coding address "06") if this is set below the value preset on the mechanical adjustable high limit "0".

Contact open:

The 1st stage burner is switched off.

Connection of External Controls (CT3 only) *(continued)*

Vitocrossal 300 – operation with external modulation controller *(continued)*

Settings on the control unit

The settings for the fixed high limit and the other settings are dependent on the safety equipment installed in accordance with applicable codes.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Single-boiler systems:

Coding "01: 1"
(factory setting)

When a building automation system is connected, only the connections on plug 143 are required. The DHW tank control unit is activated when the DHW tank temperature sensor is connected. The boiler water temperature must be set to the minimum value.

Multi-boiler systems:

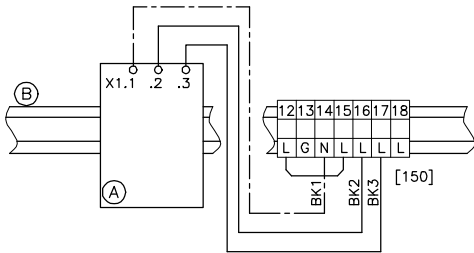
Set coding "01: 3"

When a building automation system is connected, the connections on plugs 143 and 146 are required. The DHW tank temperature and the load-dependent cascade control must be controlled through the building automation system.

CAUTION

The boiler activation contact is essential on multi-boiler systems. The contact on the lead boiler must be constantly closed.

Connection of Combustion Air Device (VD2/VD2A/CT3 only)



Connection of the Combustion Air Device Adaptor

1. Disconnect power to control and burners.
2. Install Combustion Air Device Adaptor, Part No. 7134 563 on DIN Rail inside connection enclosure (refer to installation manual of Combustion Air Device Adaptor).
3. Remove jumper between terminals 16 and 17.
4. Make connection as shown in the diagram.

IMPORTANT

Wire BK2 must be connected to terminal 16 and BK3 to terminal 17 - DO NOT reverse.

- (A) Combustion Air Device Adaptor
- (B) DIN Rail in connection enclosure

Connection of the combustion air blower to adaptor

Rated voltage: 120 VAC
 Rating current: max 5 FLA
 Recommended connection wire size: AWG 14

Ensure that combustion air blower device is suitable for this application.



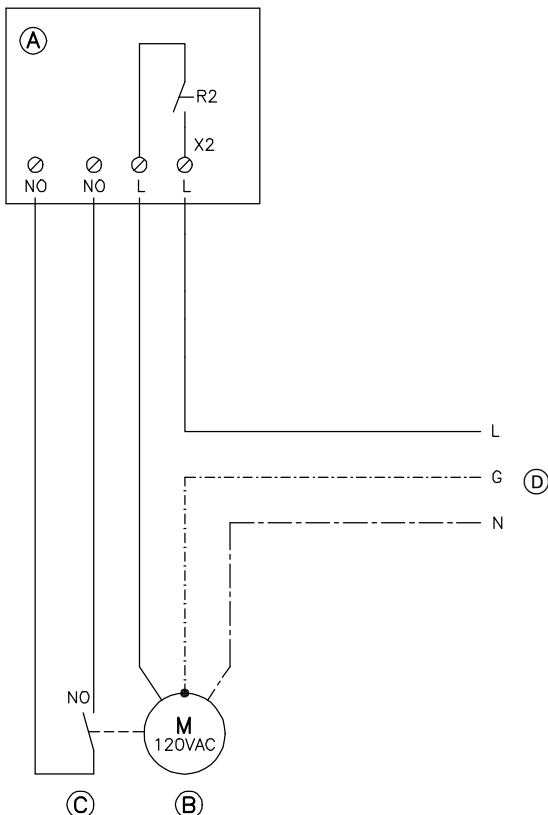
For detailed instruction on adaptor installation please refer to the adaptor's installation manual.

1. Make connection as shown in the diagram at left.

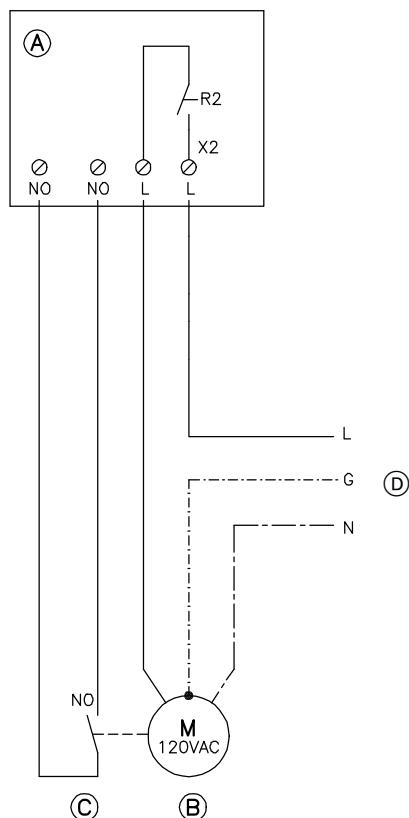
- (A) Combustion Air Device Adaptor in connection enclosure
- (B) Combustion air blower motor
- (C) Proving switch - "normally open" rated for 120 VAC.
- (D) Power supply, 120 VAC

⚠ Safety instruction!

Provide disconnect means and overcurrent protection as required by local codes.



Connection of Combustion Air Device (CM2 only)



Connection of the Combustion Air Device Adaptor

1. Disconnect power to control and burners.
2. Install Combustion Air Device Adaptor, Part No. 7134 563 on DIN Rail inside the boiler junction box (refer to installation manual of Combustion Air Device Adaptor).
3. Remove plug 150 from Vitotronic control. Remove jumper between the 2 'TR' terminals. Using 14 AWG (field supplied) connect plug terminals TR(Left), TR(Right) and neutral to the DIN rail.

Neutral to Terminal 16
TR(Left) to Terminal 18
TR(Right) to Terminal 19

Re-install the 150 plug and DIN rail connections as shown in the diagram.

IMPORTANT

Wire BK2 must be connected to terminal 18 and BK3 to terminal 19 - DO NOT reverse.

Connection of the combustion air blower to adaptor

Rated voltage: 120 VAC
Rating current: max 5 FLA
Recommended connection wire size: AWG 14

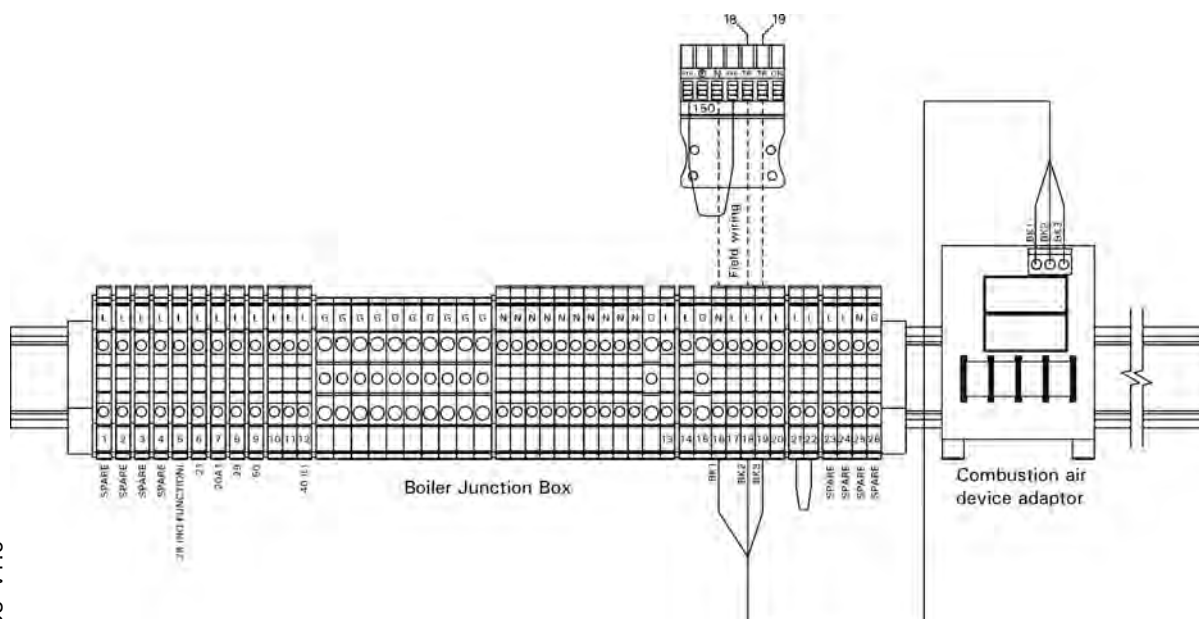
Ensure that combustion air blower device is suitable for this application.

For detailed instruction on adaptor installation please refer to the adaptor's installation manual.

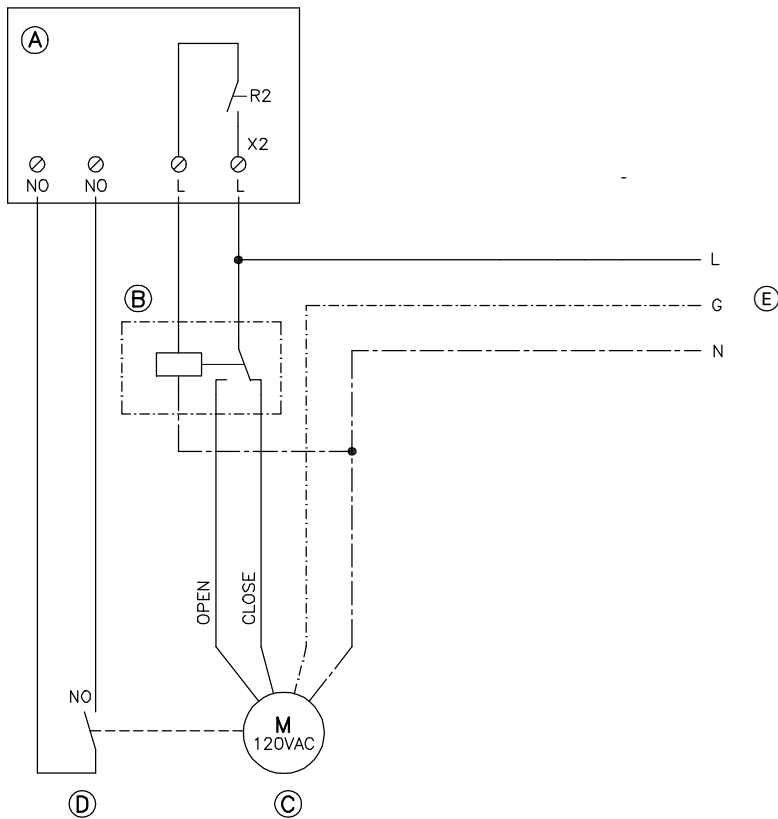
1. Make connection as shown in the diagram at left.

- (A) Combustion Air Device Adaptor in connection enclosure
- (B) Combustion air blower motor
- (C) Proving switch - "normally open" rated for 120 VAC.
- (D) Power supply, 120 VAC

⚠ Safety instruction!
Provide disconnect means and overcurrent protection as required by local codes.



Connection of Combustion Air Device *(continued)*



Connection of the combustion air damper



See damper manual for correct installation.

Ensure that the combustion air damper is suitable for this application.

1. Disconnect power to control and burner.
2. Make connection as shown in the diagram.

- Ⓐ Combustion Air Device Adaptor in connection enclosure
- Ⓑ Relay 120 VAC coil - field supplied
- Ⓒ Combustion air damper
- Ⓓ End switch rated for 120 VAC wired to "normally open" terminal on device adaptor board
- Ⓔ Power supply, 120 VAC

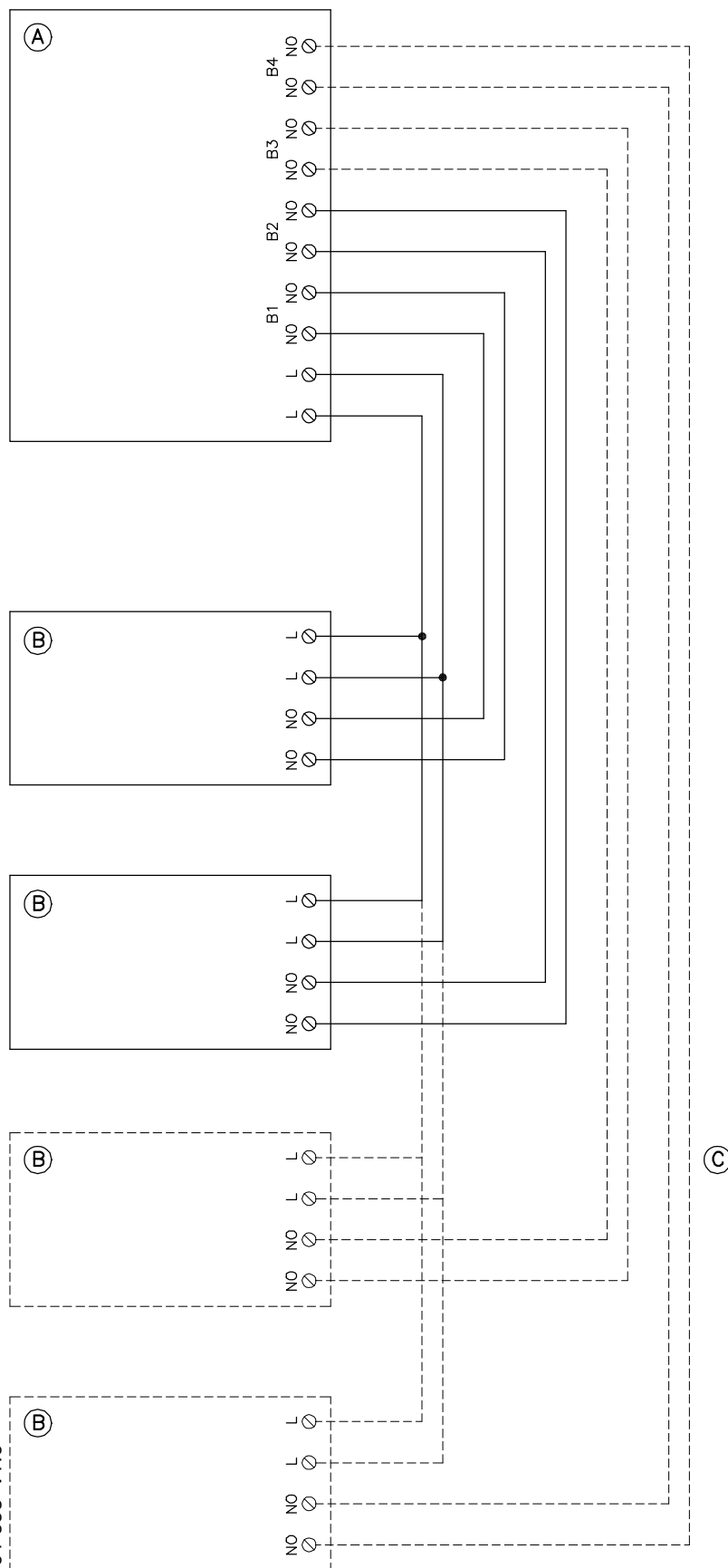
⚠ **Safety instruction!**

Provide disconnect means and overcurrent protection as required by local codes.

Note:

Spring return air dampers do not require field supplied relay.

Connection of Combustion Air Device on Multiple Boiler Systems



If a single combustion air device is required for a multiple boiler system, a Common Combustion Air Interface must be installed.

Rated voltage: 120 VAC
 Rating current: max 5 FLA
 Recommended connection wire size: AWG 14

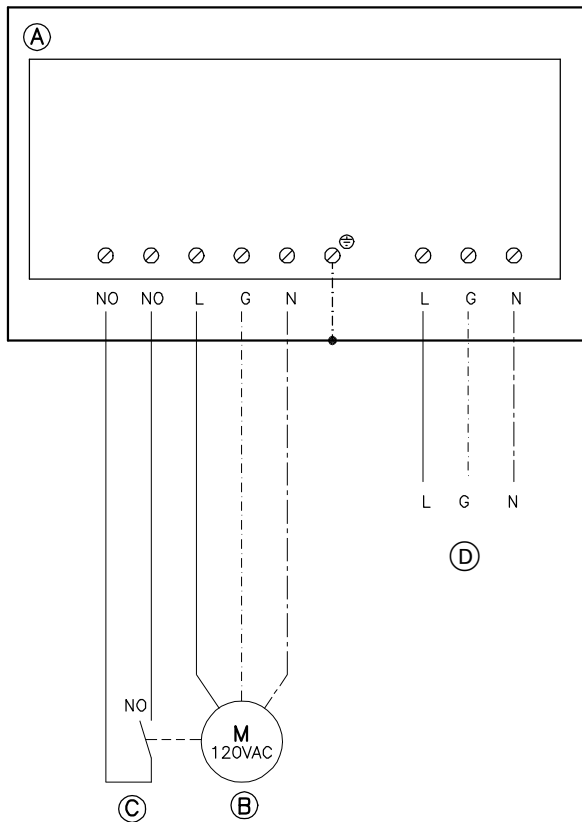
1. Install Combustion Air Device Adaptor on each boiler.
Part No. 7134 563
2. Install Common Combustion Air Device Interface,
Part No. 7134 604
as per supplied manual.
3. Make connection as shown in the diagram at left.

- (A) Common Combustion Air Device Interface (wall mount)
- (B) Combustion Air Device Adaptor in connection enclosure on each boiler
- (C) Interconnecting wiring (field supplied and connected)



Refer to Installation and Operating Instructions of Common Combustion Air Device Interface for details.


Connection of Single Combustion Air Device on Multiple Boiler Systems




Connection of the combustion air blower

- Ⓐ Common Combustion Air Device Interface
- Ⓑ Combustion air device motor 120VAC, 5 FLA max.
- Ⓒ Proving switch rated for 120 VAC
- Ⓓ Power supply, 120 VAC

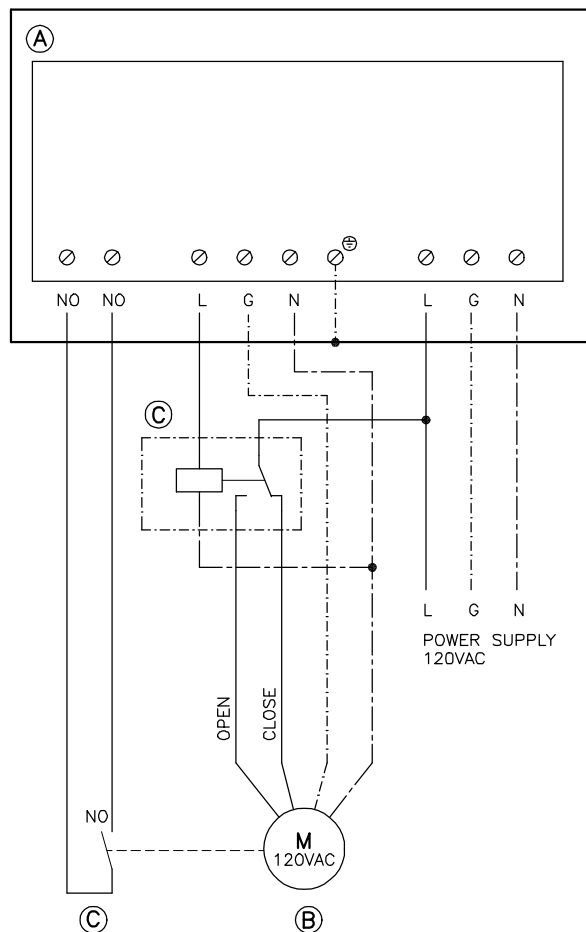
⚠ Safety instruction!
Provide disconnect means and overcurrent protection as required by local codes.

 See blower manual for current rating to correctly select the fuse.

 See Common Combustion Air Device Interface manual for Installation and Operating details.

1. Disconnect power to control and burner.
2. Make the connections as shown in the diagram.


Connection of Combustion Air Damper




Connection of the combustion air damper

- Ⓐ Common Combustion Air Device Interface
- Ⓑ Combustion air device motor 120VAC, 5 FLA max
- Ⓒ Proving switch rated for 120 VAC
- Ⓓ Power supply, 120 VAC

⚠ Safety instruction!
Provide disconnect means and overcurrent protection as required by local codes.

 See damper manual for current rating to correctly select the fuse.

 See Common Combustion Air Device Interface manual for Installation and Operating details.

1. Disconnect power to control and burner.
2. Make the connections as shown in the diagram.

Flue Gas Temp. Switch (optional for CM2 equipped with SS flue collector) (CM2 only)

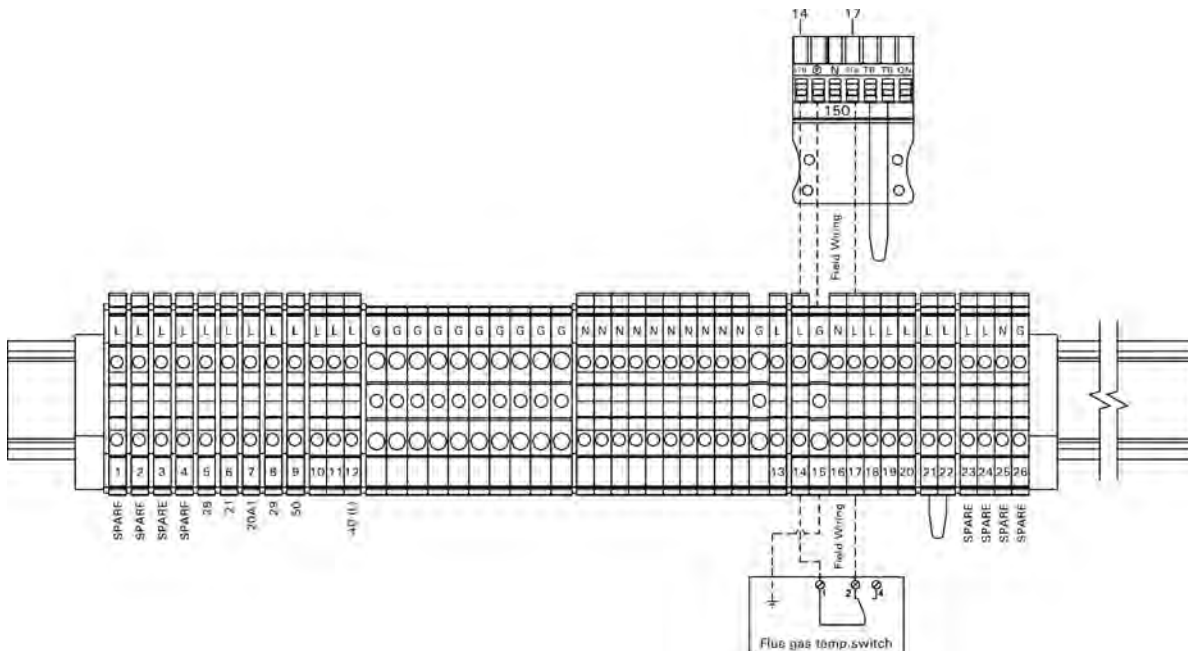


CAUTION

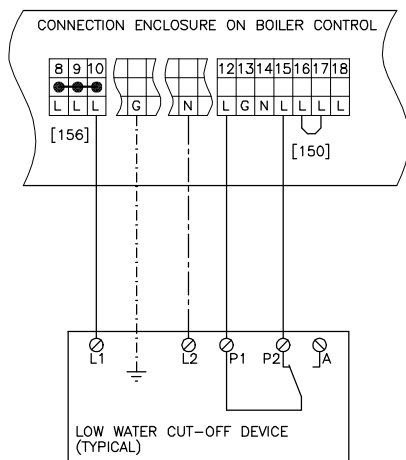
Please note that the diagram shown is only a simplified conceptual drawing of a flue gas temperature switch. Refer to the manual specific to the device for interconnection details.

1. Disconnect power.
2. Remove 150 plug from the Vitotronic control.
3. Remove STB jumper from plug 150.
4. Using 14 AWG (field supplied) connect STB(Left), STB(Right) and ground to the DIN rail as shown in the diagram.

STB(Left) to DIN 14
Ground to DIN 15
STB(Right) to DIN 17
5. Re-install the 150 plug into the Vitotronic control.
6. Connect the Flue gas temperature sensor to the DIN rail as shown in the diagram.



Connection of Low Water Cut-off Device (VD2/VD2A/CT3 only)



1. Remove jumper between terminals 12 and 15.
2. Make connection as shown in diagram.

CAUTION

Please note that the diagram at left is only a simplified conceptual drawing of a typical low water cut-off (LWCO) device. Refer to the manual specific to the device for interconnection details.

[156] Power supply for accessories.

[150] Connection for external equipment.

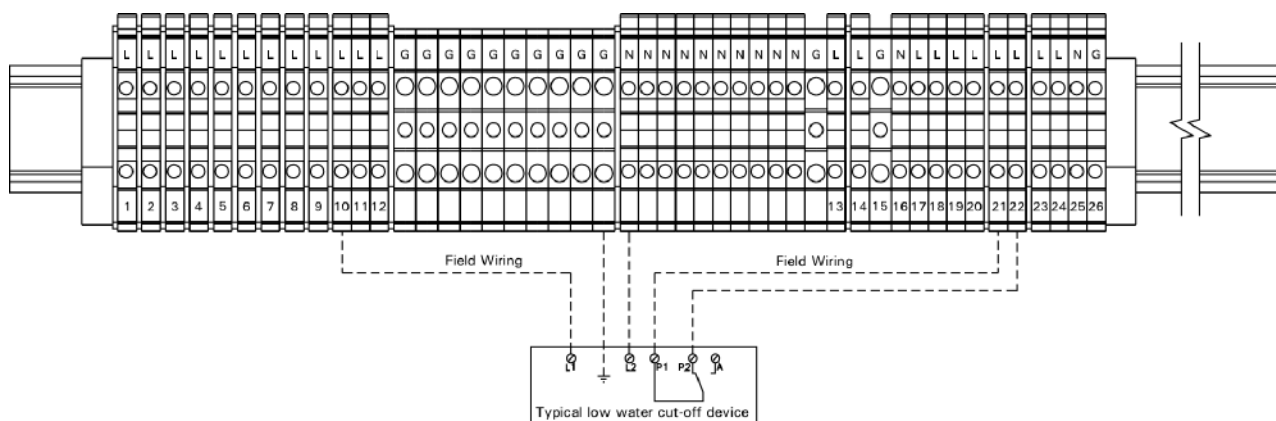
Connection of Low Water Cut-off Device (CM2 only)

1. Remove jumper between terminals 21 and 22.
2. Make connection as shown in diagram.

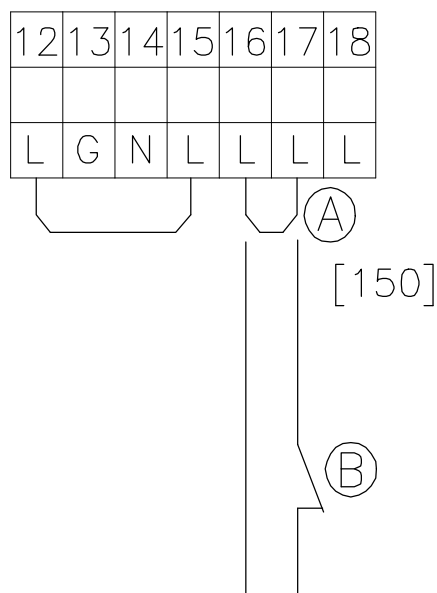


CAUTION

Please note that the diagram shown is only a simplified conceptual drawing of a typical low water cut-off (LWCO) device. Refer to the manual specific to the device for interconnection details.



Connections to Terminal 150 (VD2/VD2A/CT3 only)



- Ⓐ Jumper
Ⓑ External shut-off (dry contact)

External shut-off

1. Remove jumper between terminals 16 and 17.
2. Connect dry contact.
Controlled switch-off takes place when the contact is opened.

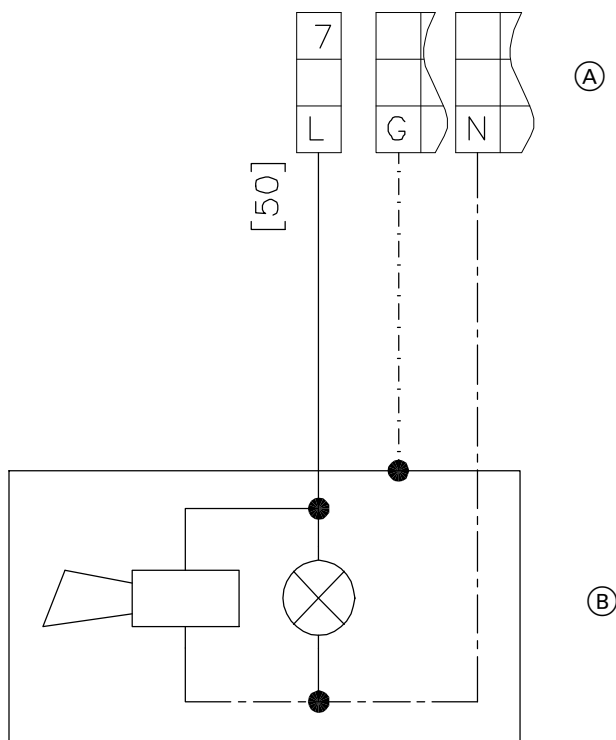
CAUTION

The terminals should be used for safety switch-off purposes only (e.g. through a limit thermostat). See pages 44 to 49 for details of controlled switch-off.
During switch-off, there is no frost protection of the heating system and the boiler is not kept at the minimum boiler water temperature.

Emergency operation

Move jumper from terminals 16 and 17 to terminals 17 and 18.

Connection of the Compiled Failure Alarm Indicator (VD2/VD2A/CT3 only)

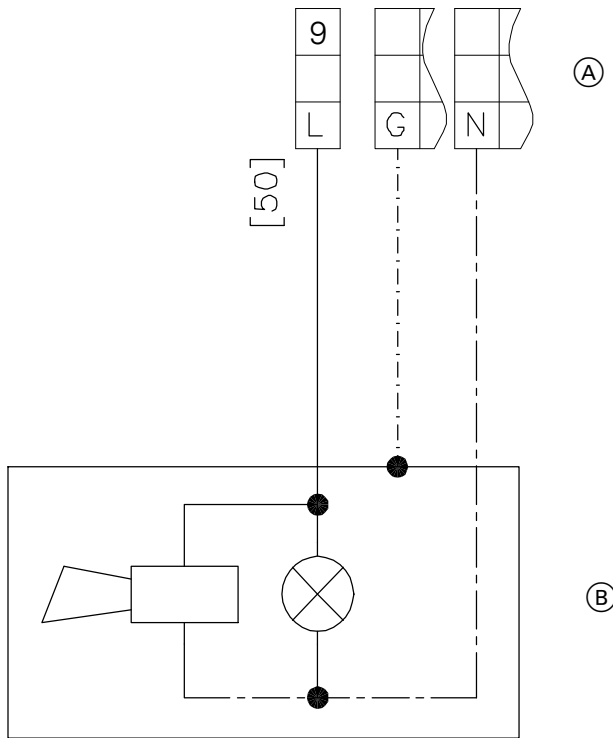


Rated voltage: 120 VAC 60 Hz
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

1. Disconnect power to control and burner.
2. Connect the compiled failure alarm as shown in the diagram.

- Ⓐ Connect terminal strip in connection enclosure of boiler control
- Ⓑ Visual and/or audible alarm device (120 VAC)

Connection of the Compiled Failure Alarm Indicator (CM2 only)

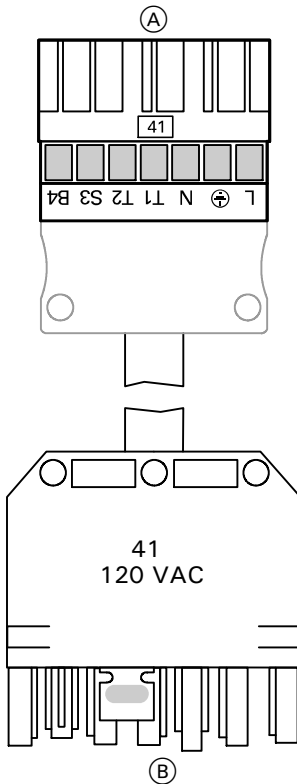


Rated voltage: 120 VAC 60 Hz
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

1. Disconnect power to control and burner.
 2. Connect the compiled failure alarm as shown in the diagram.
- Ⓐ Connect terminal strip in connection enclosure of boiler control
- Ⓑ Visual and/or audible alarm device (120 VAC)

Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only)

For burners with plug-in connection



The burner cables are included in the standard delivery of the Vitotronic.
Connect the burner in accordance with applicable codes.

- Ⓐ To boiler control unit
- Ⓑ To burner

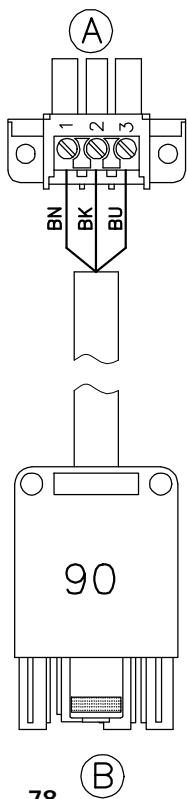
Terminal codes

- L1 Phase via fixed high limit to the burner
- ⊕ Ground connection
- N Neutral connection to the burner
- T1,T2 Control circuit
- S3 Connection for burner fault indicator
- B4 Connection for burner hours counter

1. Disconnect power to burner and boiler control.

2. Connect plugs **41** and plug **90** to respective counter plugs in boiler control unit.

3. Connect the 7-pole plug **41** and the 3-pole plug **90** to the burner.



- Ⓐ To plug-in connection in connection enclosure
- Ⓑ To burner

Terminal codes

- 1,2,3 Control circuit "2nd stage burner or modulation controller" (via two-point controller with 2-stage operation; via three-point controller with modulating operation)
- 1 From burner
- 2 Modulating down
- 3 Modulating up/2nd stage ON

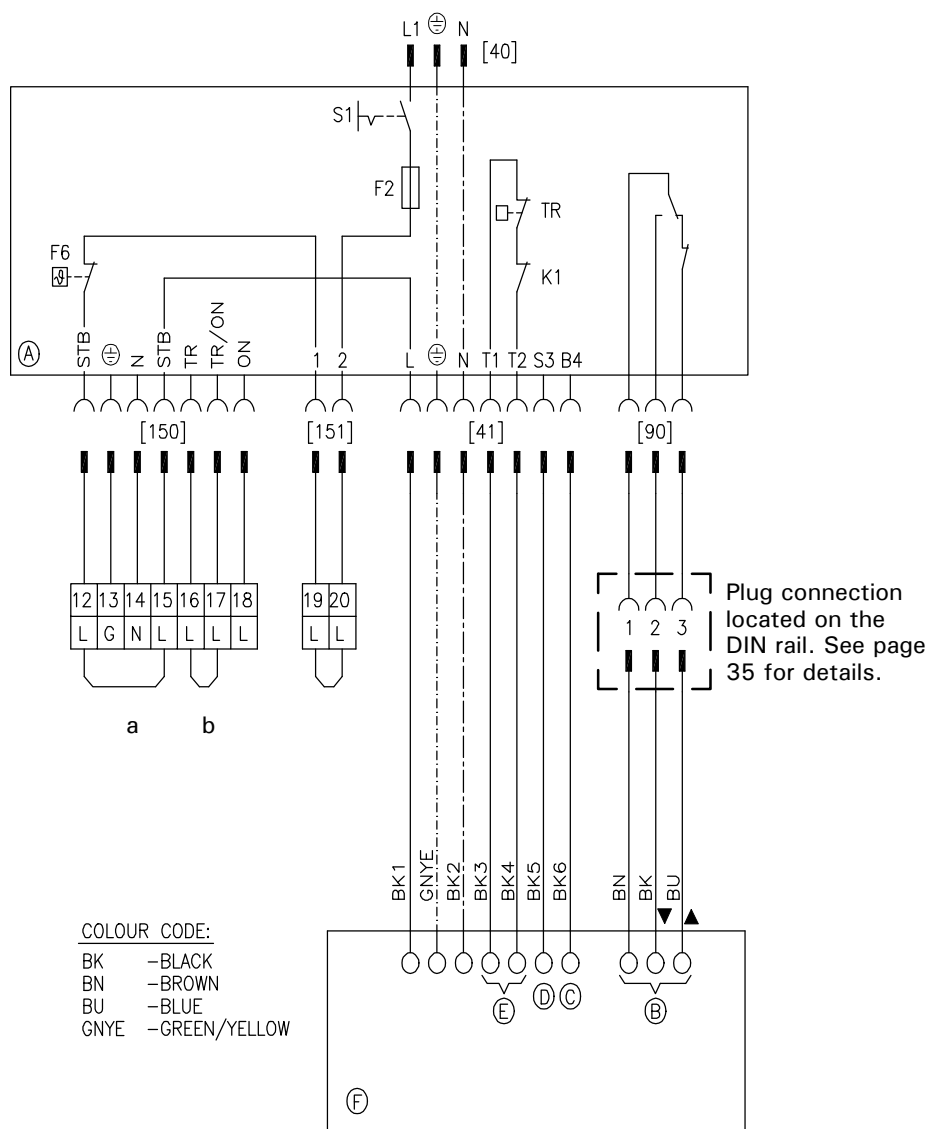
Colour codes as applicable

- BK Black
- BN Brown
- BU Blue

Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

CAUTION

This is a generic connection drawing only! Follow the burner manufacturer's connection drawings for Viessmann controls.



Burner power supply not shown.

- (A) Control unit
(Legend: see wiring diagram)
- (B) 2nd stage or modulating *1
- (C) Hours counter, stage 1 *1
- (D) Burner fault indicator *1
- (E) Control circuit, stage 1/
basic load *1
- (F) Burner

- [40] Power supply connection of control
unit 120 VAC
- [41] Burner, 1st stage
- [90] Burner, 2nd stage

- [150] Plugs for external equipment
 - (a) External safety devices
(remove jumper when connecting)
 - (b) External controlled switch-off
(remove jumper when connecting)
- [151] Safety circuit. Emergency
shut-off

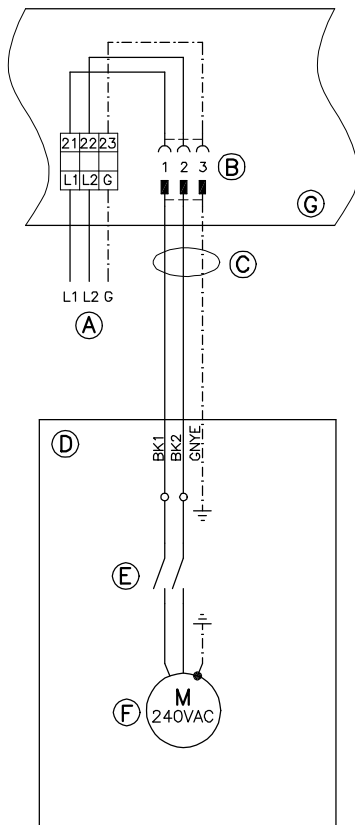
Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

Burner motor power supply connection *(continued)*

For burners with 240 VAC, 1PH power supply and connection in conduit.

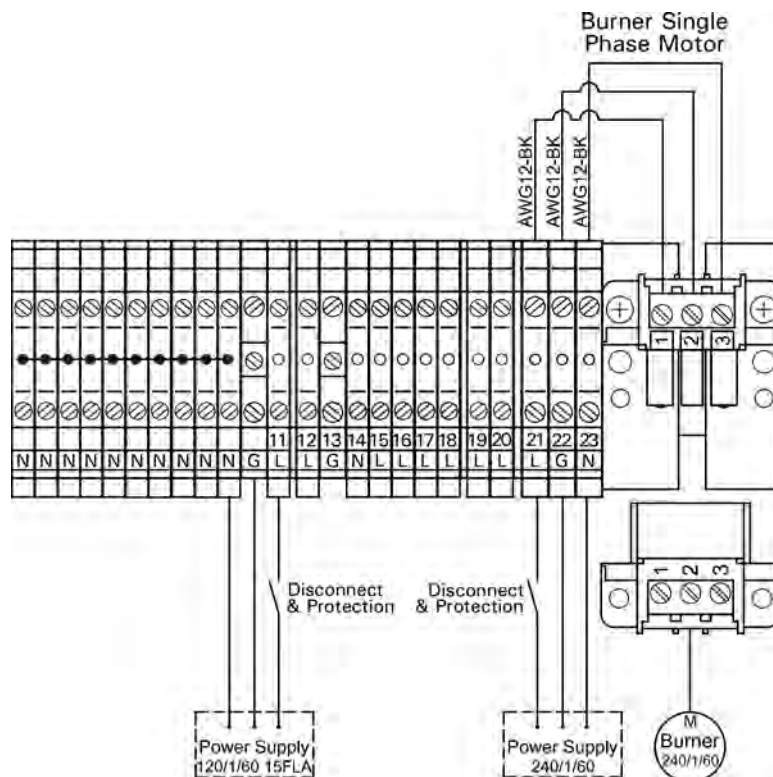


See burner manual for correct fuse and wire gauge sizing, and specific connections for Viessmann controls.



- (A) Burner motor power supply 240 VAC, 1PH
- (B) Connection terminals and plug inside connection enclosure
- (C) Cable and conduit- factory supplied
- (D) Burner
- (E) Motor starter
- (F) Burner motor
- (G) Connection enclosure on boiler control

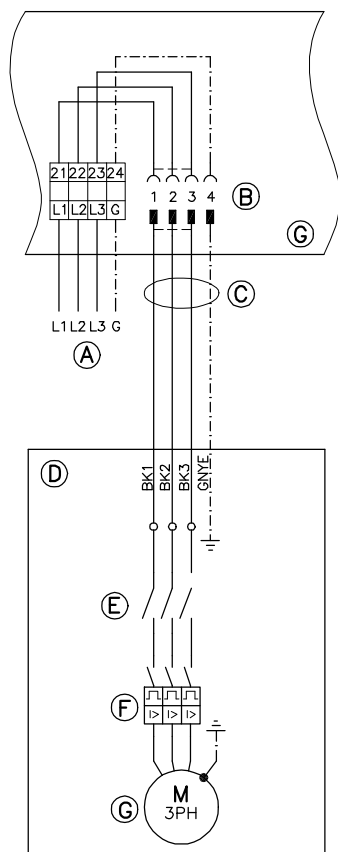
1. Disconnect power to burner and boiler control.
2. Connect 240 VAC power to the terminals 21, 22 and 23 on the DIN rail inside the connection enclosure. Provide fuseable disconnect means according to local codes.
3. Connect supplied power cable to the motor terminals on the burner.
4. Connect cable plug to the socket on the DIN rail in the connection enclosure.



Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

Burner motor power supply connection *(continued)*

For burners with 3PH 208, 460 or 575V power supply.



- (A) Burner motor power supply 3PH 208, 460 or 575V
- (B) Connection terminals and plug inside connection enclosure
- (C) Cable and conduit - factory supplied
- (D) Burner
- (E) Motor starter
- (F) Overload
- (G) Burner motor
- (H) Connection enclosure

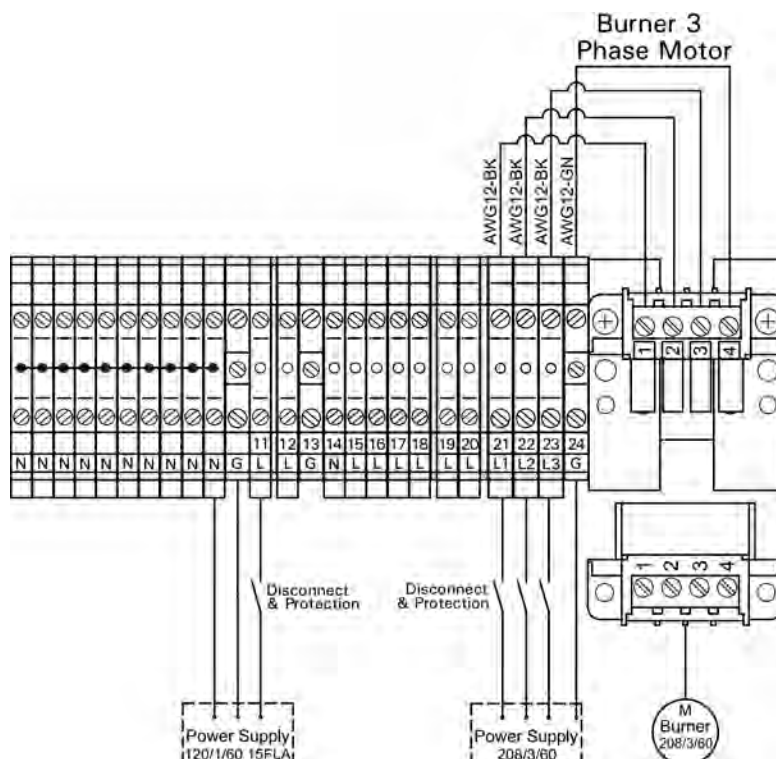


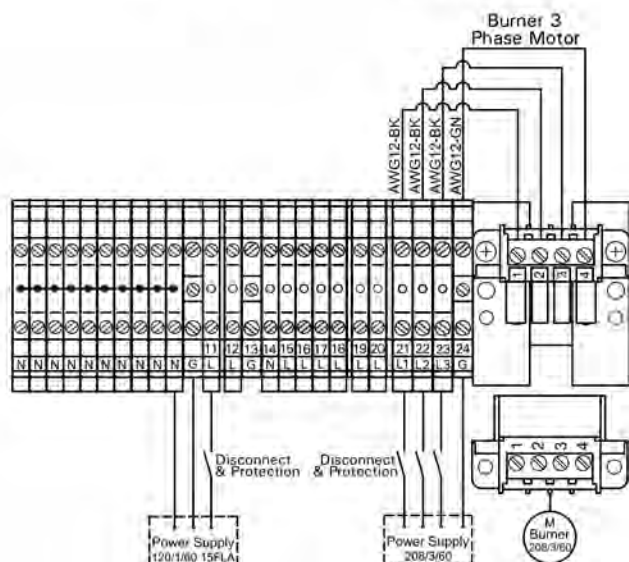
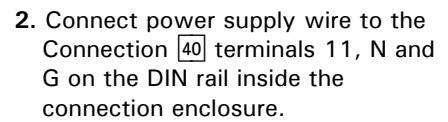
See burner manual for correct fuse and wire gauge sizing, and specific connections for Viessmann controls.

1. Disconnect power to burner and boiler control.
2. Connect 3PH power to the terminals 21, 22, 23 and 24 on the DIN rail inside the connection enclosure. Provide fuseable disconnect means according to local codes.
3. Connect supplied power cable to the motor terminals on the burner.
4. Connect cable plug to the socket on the DIN rail in the connection enclosure.

CAUTION

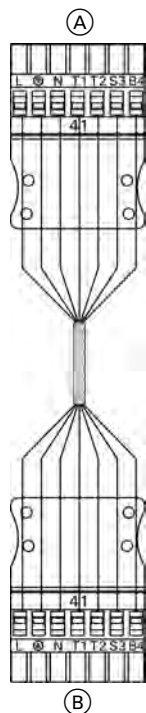
During commissioning check for correct motor rotation. If motor rotates in opposite direction than indicated on the burner, disconnect power supply and reverse wires BK1 and BK2 on the burner terminals.





Burner Connection, Burner Control Wiring (CM2 only)

For burners with plug-in connection



The burner cables are included in the standard delivery of the Vitotronic.
Connect the burner in accordance with applicable codes.

- Ⓐ To boiler control unit
- Ⓑ To burner interface

Terminal codes

- L1 Phase via fixed high limit to the burner
- ⊕ Ground connection
- N Neutral connection to the burner
- T1, T2 Control circuit
- S3 Connection for burner fault indicator
- B4 Connection for burner hours counter

1. Disconnect power to burner and boiler control.
2. Connect plugs **41** and plug **90** to respective counter plugs in boiler control unit.
3. Connect the 7-pole plug **41** and the 3-pole plug **90** to the burner.



- Ⓐ To plug-in connection in connection enclosure
- Ⓑ To burner interface

Terminal codes

- 1, 2, 3 Control circuit "2nd stage burner or modulation controller" (via two-point controller with 2-stage operation; via three-point controller with modulating operation)
- 1 From burner
- 2 Modulating down
- 3 Modulating up/2nd stage ON

Colour codes as applicable

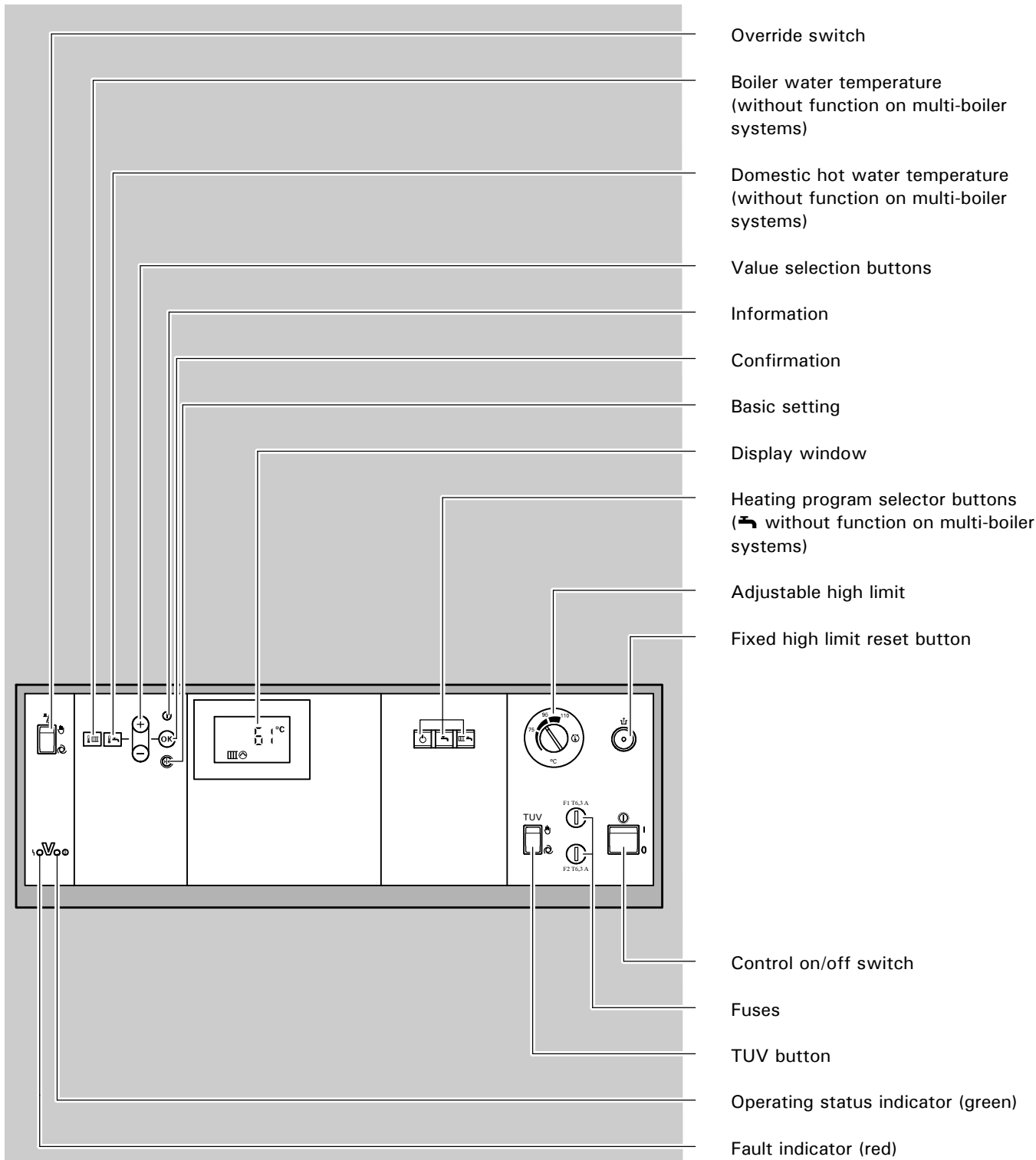
- BK Black
- BN Brown
- BU Blue

Procedure (overview)

	Page
1. Controls and indicators	85
2. Check the fixed high limit	86
3. Integrate the control unit in the LON BUS system (in conjunction with heating circuits connected downstream)	87
4. Carry out participant check	88
5. Match the control unit to the system type	89
6. Check outputs (actuators) and sensors	89
7. Match the coding addresses	90

Steps

1. Controls and indicators



Steps *(continued)*

2. Check the fixed high limit


The check is made via the "TUV button" (see page 85).


When making the check, the **"TUV"** button must be kept continuously pressed.

A minimum supply is required during the check.

The minimum amount of recirculated water should be 10% of the amount recirculated at the rated load.

The amount of heat consumed should be reduced as far as possible.

The adjustable high limit "" is bridged. The burner is switched on until the boiler water temperature reaches the safety temperature and the fixed high limit operates.

When the burner is switched off by the fixed high limit, release the **"TUV"** button, wait until the boiler water temperature has fallen 15 to 20°C / 27 to 36°F below the selected safety temperature and then reset the fixed high limit by pressing the "" button.

Steps (continued)

3. Integrate the control unit in the LON BUS system

Single-boiler system only

The LON communication module (accessory) must be inserted (see page 111).

Set the LON participant number

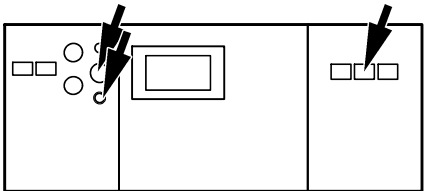
Set the LON participant number via coding address "77" in coding 1 (factory setting: "77: 1").

→ See page 115 for coding 1.

Please note:
The same number must **not** be assigned twice within a LON BUS system.

Update the LON participant list

This is only possible when all participants are connected and the control unit is coded as the error manager (coding "79: 1").



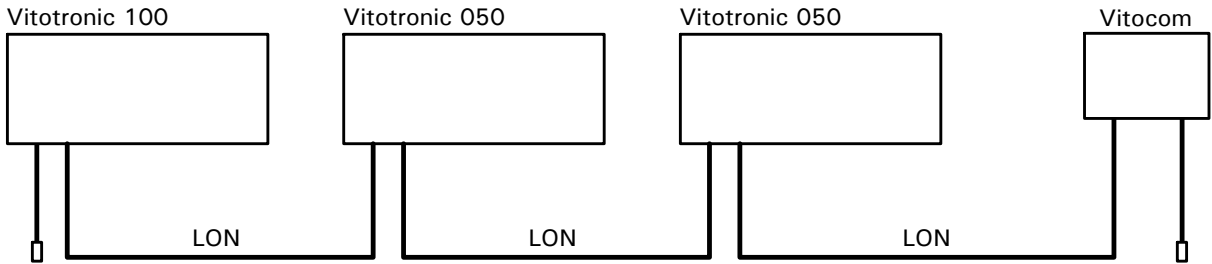
1. Press and simultaneously for approx. 2 seconds.

→ The participant check is initiated (see also page 88).

2. Press .

→ The participant list is updated after approx. 2 minutes.
The participant check is terminated.

Example of single-boiler system with Vitotronic 050 heating circuit controls and Vitocom connected downstream



Participant No. 1 Coding "77: 1"	Participant No. 10 Coding "77: 10"	Participant No. 11 Set coding "77: 11"	Participant No. 100
Control unit is error manager Coding "79: 1"	Control unit is not error manager Coding "79: 0"	Control unit is not error manager Coding "79: 0"	Unit is error manager
---	Transmit time via LON Set coding "7b: 1"	Time is received via LON Set coding "81: 3"	Time is received via LON
---	Transmit outdoor temperature via LON Set coding "97: 2"	Outdoor temperature is received via LON Set coding "97: 1"	---

Steps *(continued)***4. Carry out participant check****Single-boiler system only**

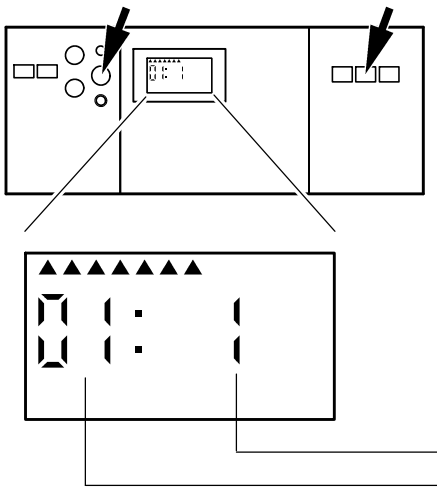
The participant check is used to verify the communication of the system units connected to the error manager.

Requirements:

The control unit must be coded as the error manager (coding "79: 1")

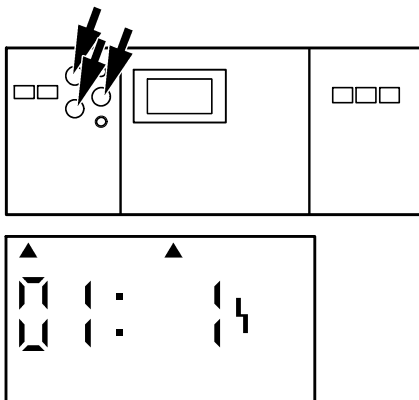
The LON participant number must be coded in all control units (see page 87)

The participant list must be updated in the error manager (see page 87)



1. Press and simultaneously for approx. 2 seconds.

→ *The participant check is initiated. All 7 arrows appear in the display window.*



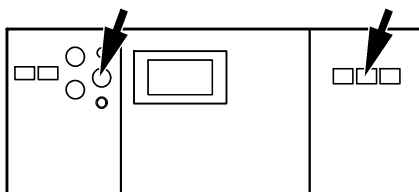
2. Select the required participant with or .

3. Activate the check with .
- If communication between the two units is verified, the arrows in the display window stop flashing.
- If communication is not verified, the display shown on the left appears.

→ *The arrows in the display will flash until the check is completed. The display window and all lit buttons of the selected participant flash for approx. 60 seconds.*

→ *Check the LON connection (see page 111).*

4. To check further participants, follow the steps described in points 2 and 3.



5. Press and simultaneously for approx. 1 second.

→ *The participant check is terminated.*

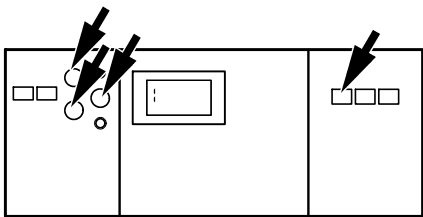
Steps *(continued)*

5. Match the control unit to the system type

Set the following coding addresses in coding 2: → See page 117 for coding 2.

- "00" System type
- "01" Single or multi-boiler system
- "02" Burner type
- "03" Oil or gas-fired operation
- "07" Boiler number
- "0C" Return temperature raising
- "0d" Therm-Control is effective for ...
- "4C" plug 20 function
- "4d" plug 29 function
- "4E" plug 52 function

6. Check outputs (actuators) and sensors



Carry out relay test

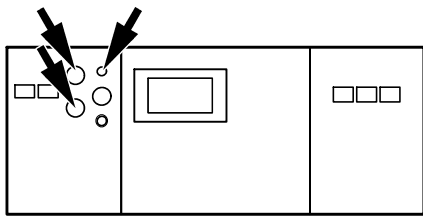
1. Press **⏏** and **OK** simultaneously for approx. 2 seconds.
2. Select relay outputs with the **+** or **-** button.
3. Press **OK**.

→ Relay test is activated.

→ Relay test is terminated.

The following relay outputs can be selected depending on the system equipment installed:

Display	Relay function
1	Burner/stage 1 ON
2	Burner stage 1 and 2 ON/modulation open
3	Burner modulation neutral
4	Burner modulation closed
5	Output 20 ON
6	Output 29 ON
7	Output 52 open
8	Output 52 neutral
9	Output 52 closed
10	DHW pump ON
11	Central fault indicator ON



Check sensors

1. Press **i**.
2. Scan sensors with **+** or **-**.
3. Press **i**.

→ Scanning of operating status information is activated (see page 97).

→ Scanning is terminated.

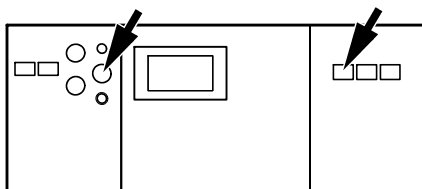
Steps *(continued)*

7. Match the coding addresses

Match control unit to modulating burner

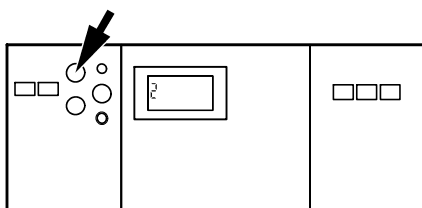
Please note:

The burner must be adjusted. In order to achieve a wide modulation range, the minimum output should be set as low as possible (take chimney/flue system into account).



1. Start up the burner. → *The relay test is activated.*

2. Press **ON** and **OK** simultaneously for approx. 2 seconds.

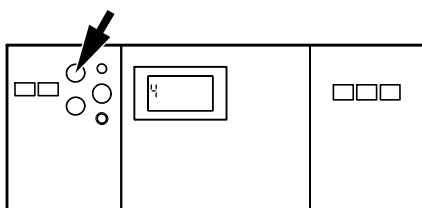


3. With **+** activate the function "Modulating burner **open**" (display: 2) and wait until the actuating drive of the burner is at maximum output.

→ *Make a note of the value.*

4. Establish the maximum burner output through the fuel consumption.

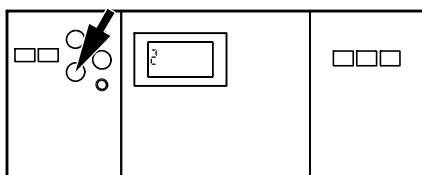
→ *Make a note of the value.*



5. With **+** activate the function "Modulating burner **closed**" (display: 4) and measure the time it takes for the actuating drive of the burner to reach the minimum output.

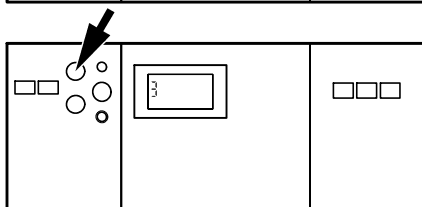
→ *Make a note of the value.*

6. Establish the minimum burner output (basic output) through the fuel consumption.



7. With **-** activate the function "Modulating burner **open**" (display: 2) and, after one-third of the time measured in point 5, activate the function "Modulating burner **neutral**" with **+** (display: 3).

→ *Make a note of the value.*



8. Establish the partial output through the fuel consumption. → *The relay test is terminated.*

9. Press **OK**.

Steps *(continued)***7. Match the coding addresses** *(continued)*









10. Set the established values in coding → *See page 115 for coding 1.*
level 1.

Address	Setting of
05	the partial output (see point 8) as a percentage proportion of the max. output; e.g. partial output: 170 kW max. output: 210 kW $\frac{170 \text{ kW}}{210 \text{ kW}} \times 100 \% = 81 \%$
08	units and tens digits of the maximum output established in point 4: e.g. max. output: 210 kW – here set: 10
09	hundreds digit of the maximum output established in point 4: e.g. max. output: 210 kW – here set: 2
0A	the basic output (see point 6) as a percentage proportion of the max. output; e.g. basic output: 70 kW max. output: 210 kW $\frac{70 \text{ kW}}{210 \text{ kW}} \times 100 \% = 33 \%$
15	the operating time in seconds established in point 5

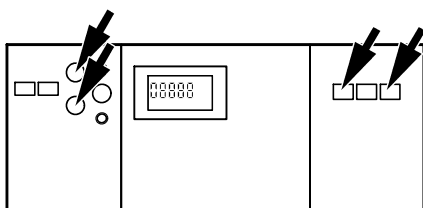
Please note:

You will find details of other possible settings in the sections entitled "Coding 1" and "Coding 2" (see page 115 and 117).

Overview of Service Levels

Function	Button combination	To exit	Page
Temperatures, boiler coding cards and scans	Press  and   simultaneously for approx. 2 seconds	Press OK	93
Relay test	Press  and OK simultaneously for approx. 2 seconds	Press OK	89
Participant check (in conjunction with LON)	Press  and OK simultaneously for approx. 2 seconds	Press  and OK simultaneously for approx. 1 second	88
Operating status information	Press 	Press 	97
Service display		Press OK	98

Temperatures, Boiler Coding Cards and Scans



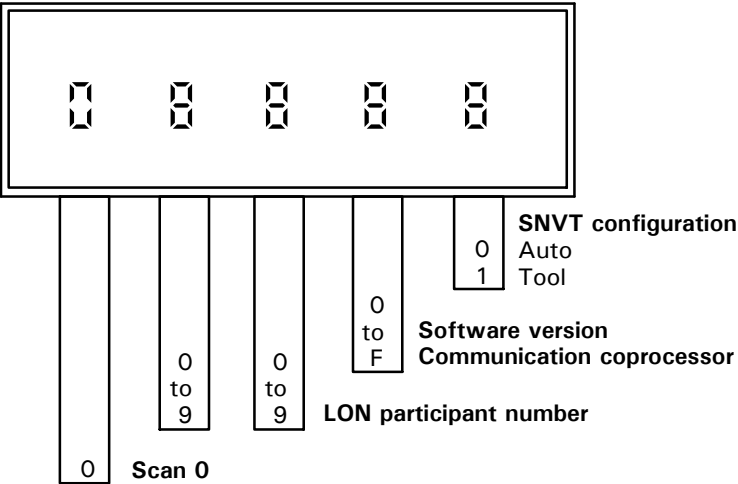
1. Press and simultaneously for approx. 2 seconds. → *Access diagnosis level.*
2. Select the required data for scanning with the or button.
3. Press . → *Exit diagnosis level.*

The following values can be scanned depending on the system equipment installed:

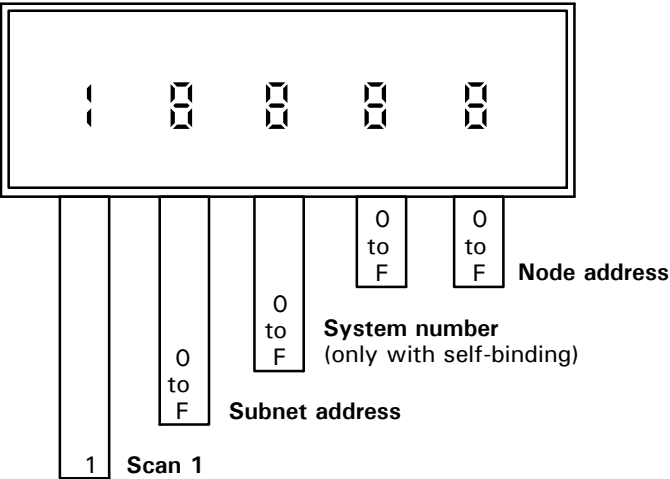
Display	Meaning	Notes
00000	Scan 0	Only in conjunction with LON communication module; see page 94
10000	Scan 1	Only in conjunction with LON communication module; see page 94
20000	Scan 2	Only in conjunction with LON communication module; see page 94
3 65 °C	Set-point boiler water temperature (effective set-point value including boiler protection)	---
4 70 °C	Maximum request temperature	---
40000	Scan 4	See page 95
5 55 °C	Set-point domestic hot water temperature	---
0230 °C	Maximum flue gas temperature	See coding address "1F"; can be reset to the actual value by pressing
1 10 10	Boiler coding card	See page 112
b 000	Scan b/d	See page 95
L 000	Scan L	See page 96
00000	Scan 0	See page 96

Temperatures, Boiler Coding Cards and Scans *(continued)*

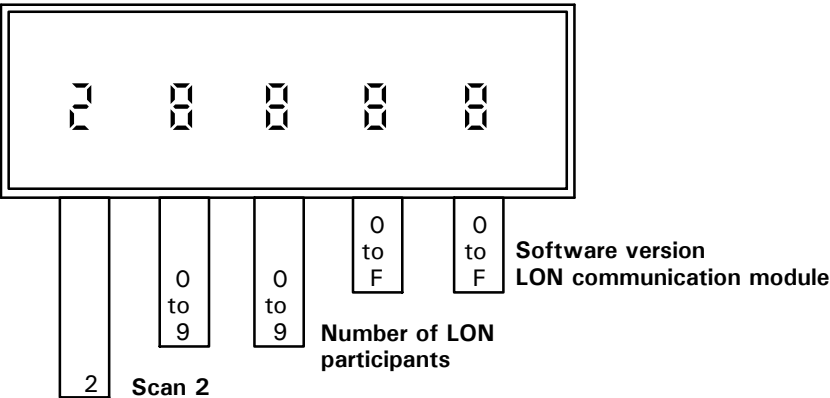
Scan 0



Scan 1

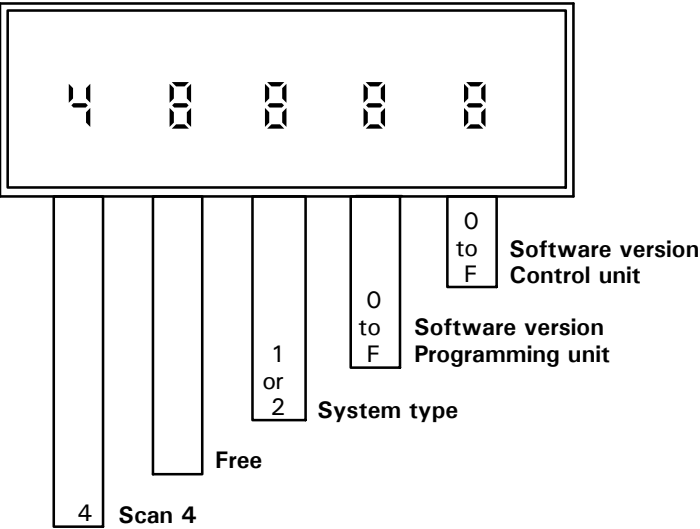


Scan 2

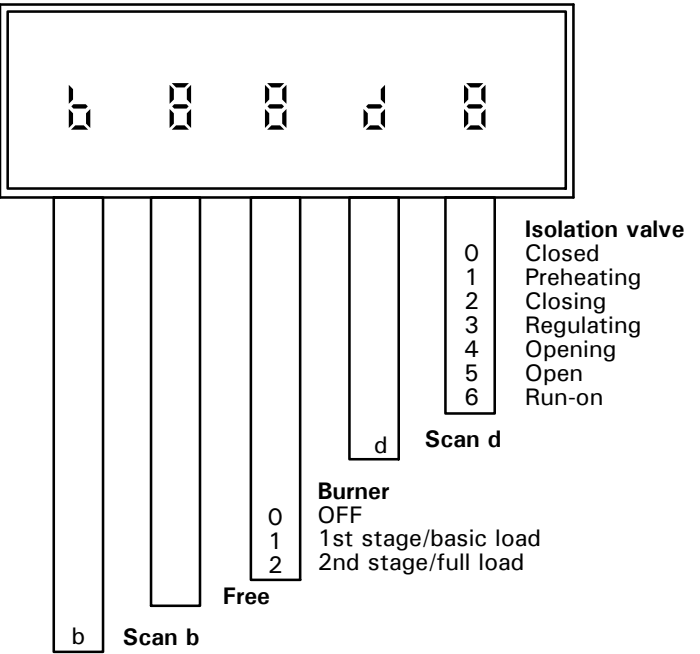


Temperatures, Boiler Coding Cards and Scans (continued)

Scan 4

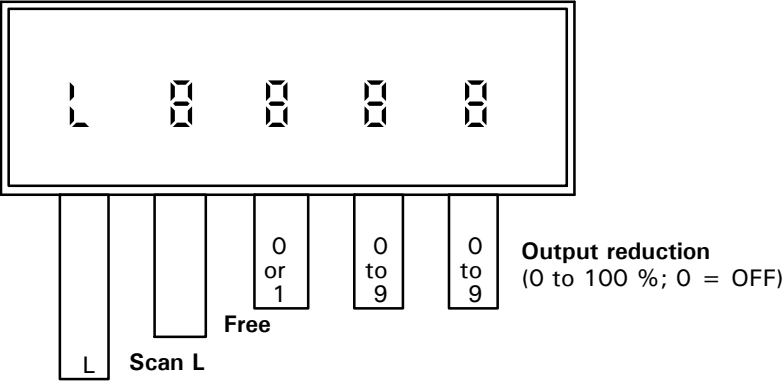


Scan b/d

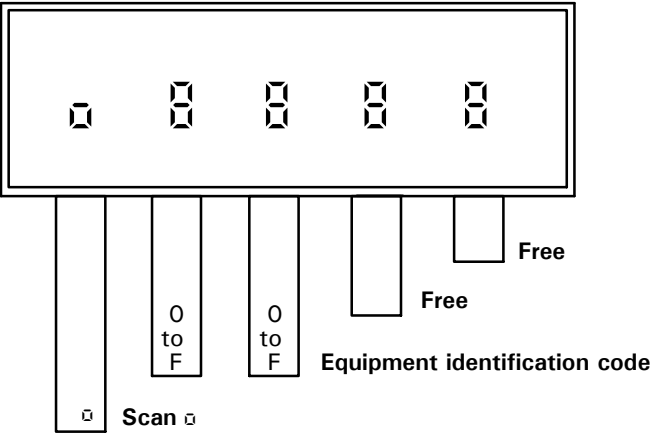


Temperatures, Boiler Coding Cards and Scans *(continued)*

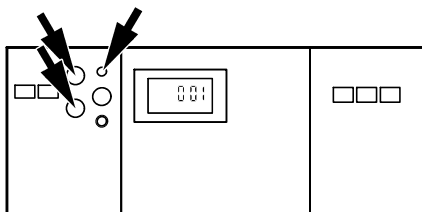
Scan L



Scan 0



Scanning Service Information



1. Press **i**.

→ *Operating status scanning mode is activated.*

2. Select the required operating status data for scanning with the **+** or **-** button.

3. Press **i**.

→ *Exit the operating status scanning mode.*

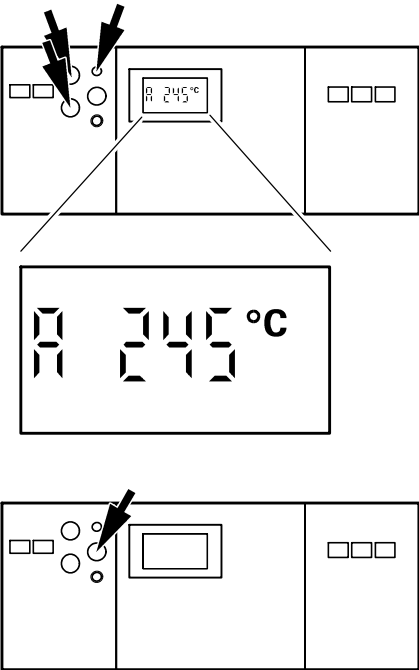
The following operating status information can be scanned depending on the system equipment installed:

Display	Meaning	Notes
0 01	LON participant number	Only displayed if LON communication module is connected
3 65 °C	Boiler temperature	--
5 50 °C	DHW tank temperature (1st DHW tank temperature sensor)	Only displayed if DHW tank temperature sensor is connected
50 45 °C	DHW tank temperature (2nd DHW tank temperature sensor)	Only displayed if DHW tank temperature sensor is connected
6 55 °C	Return temperature 17A (1st return temperature sensor)	Only displayed if return temperature sensor is connected
8 130 °C	Flue gas temperature	Only displayed if flue gas temperature sensor is connected
9 60 °C	Return temperature 17B (2nd return temperature sensor)	Only displayed if return temperature sensor is connected
▲ 635 12 h	Burner hours run 1st stage	The hours run can be reset to "0" by pressing ↵ . The hours run displayed are approximate values only
▲▲ 095 12 h	Burner hours run 2nd stage	The hours run can be reset to "0" by pressing ↵ . The hours run displayed are approximate values only
▲▲▲ 304 11	Burner starts	The number of burner starts can be reset to "0" by pressing ↵

Scanning and Resetting the Service Display

Please note:
If a service is carried out before the service display appears, set the coding address "24: 1" and then coding address "24: 0".

When the limit values selected via coding addresses "1F", "21" and "23" (see page 104) are reached, one of the following displays flashes on the programming unit:



Display	Meaning
A 245 °C	Max. flue gas temperature reached
355 0 h	Number of burner hours run reached
12 ⌚	Time interval (e.g. 12 months) reached

1. Scan the service messages with the \oplus or \ominus button.
2. Press OK .

→ The service display is turned off.
Please note:
An acknowledged service message can be displayed again by pressing OK (for approx. 3 seconds).

After carrying out maintenance


1. Reset coding "24: 1" (see page 104) to "24: 0".
2. If necessary:
 - Press i .
 - Reset burner hours run and number of burner starts with the ⌂ button.
 - Press i .
3. If necessary:
 - Press ⏻ and ⏻ simultaneously for approx. 4 seconds.
 - Reset maximum flue gas temperature (⌂) to the actual value by pressing ⌂ .
 - Press OK .

→ **Please note:**
If coding address "24" is not reset, the service display will re-appear on Monday morning.

→ See "Temperatures, boiler coding cards and scans" on page 77.

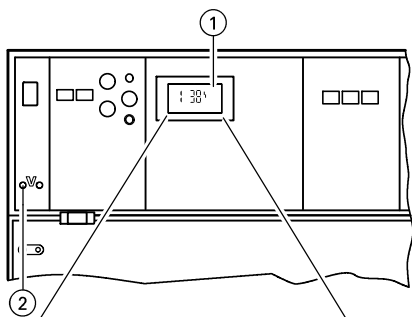
→ See "Scanning operating status information" on page 81.

Troubleshooting Steps

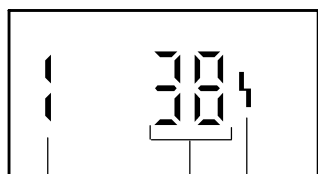
		Page
<div>Diagnosis</div> 	1. Establish fault message or ascertain behaviour of system	
	2. Look for the corresponding cause of the fault in the diagnosis tables.....	101
	<i>Please note:</i> Retrieve fault codes from the fault memory.....	100
	3. Establish the action required in the table	
<div>Correction</div>	4. Correct the fault	

Diagnosis

Faults with fault display on the programming unit



The red fault indicator (2) flashes whenever there is a fault.



When a fault message is transmitted, a fault code flashes in the display (1) of the programming unit.

Other fault codes which may be stored can be called up by pressing the (+) or (-) button.

Fault symbol

Fault code

Fault number

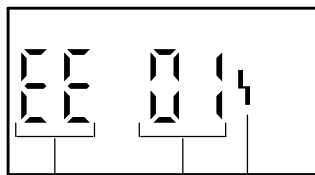
→ The meaning of the fault code is explained in the table on page 101 onwards.

→ The fault can be acknowledged by pressing **OK**. The fault message in the display (1) is blanked out; the red fault indicator (2) continues to flash. The central fault indicator connected to plug **50** is switched off.

If an acknowledged fault is not rectified within 24 hours, the fault message will re-appear in the display.

Vitotronic 100 as error manager

A fault on another LON participant is displayed as shown:



Fault symbol

LON participant number of the unit with the fault

"EE" = External fault

To retrieve an acknowledged fault message

Press **OK** for approx. 2 seconds; select the acknowledged fault by pressing the (+) or (-) button.

→ Fault is displayed.

Diagnosis *(continued)*

Faults with fault display on the programming unit *(continued)*

Fault code in display	Behaviour of system	Cause of fault	Action
30	Burner is switched on and off by the adjustable high limit	Short circuit Boiler temperature sensor	Check boiler temperature sensor (see page 42)
30	Burner is switched on and off by the adjustable high limit	Open circuit Boiler temperature sensor	Check boiler temperature sensor (see page 42)
50	DHW pump ON: set-point boiler temperature = set-point DHW tank temperature, priority controls are cancelled or In conjunction with DHW heating: Tank heating is switched on and off by Tank temperature sensor 2	Short circuit DHW tank temperature sensor 1	Check DHW tank temperature sensor (see page 43)
51	In conjunction with DHW heating: Tank heating is switched on and off by Tank temperature sensor 1	Short circuit DHW tank temperature sensor 2	Check DHW tank temperature sensor (see page 43)
50	DHW pump ON: set-point boiler temperature = set-point DHW tank temperature, priority controls are cancelled or In conjunction with DHW heating: Tank heating is switched on and off by Tank temperature sensor 2	Open circuit DHW tank temperature sensor 1	Check DHW tank temperature sensor (see page 43)
59	In conjunction with DHW heating: Tank heating is switched on and off by DHW tank temperature sensor 1	Open circuit DHW tank temperature sensor 2	Check DHW tank temperature sensor (see page 43)
60	■ No output reduction ■ Return control open ■ Boiler with maximum temperature	Short circuit Temperature sensor 17 A	Check temperature sensor (see page 44)
60	■ No output reduction ■ Return control open ■ Boiler with maximum temperature	Open circuit Temperature sensor 17 A	Check temperature sensor (see page 44)
70	Shunt pump ON continuously In conjunction with DHW heating: Mixing valve of primary circuit closed, no domestic hot water heating	Short circuit Temperature sensor 17 B	Check temperature sensor (see page 44)
70	Shunt pump ON continuously In conjunction with DHW heating: Mixing valve of primary circuit closed, no domestic hot water heating	Open circuit Temperature sensor 17 B	Check temperature sensor (see page 44)

Diagnosis *(continued)*

Faults with fault display on the programming unit *(continued)*

Fault code in display	Behaviour of system	Cause of fault	Action
00	Controlled operation	Therm-Control configuration error: plug 17A of Therm-Control temperature sensor not inserted	Insert plug 17A On Vitocrossal: Check that coding "Od: 0" is set.
06	Controlled operation, DHW tank may be cold	DHW heating configuration error: Coding "55: 3" is set, but plug 17B is not inserted and/or coding "4C: 1" and "4E: 1" not set	Insert plug 17B and check coding
0C	Controlled operation	Return temperature sensor configuration error: Coding "0C: 1" is set, but plug 17A is not inserted and/or coding "4E: 0" is not set	Insert plug 17A and check coding
0d	Controlled operation	Butterfly valve configuration error: Coding "0C: 2", "0C: 3" or "0C: 4" is set, and coding "4E: 1" is set	If butterfly valve is installed: Set coding "4E: 0" If no butterfly valve is installed: Set coding "0C: 0" or "0C: 1"
60	Controlled operation	Short circuit Flue gas temperature sensor	Check flue gas temperature sensor (see page 45)
61	Controlled operation	Communication error Programming unit	Check connections, if necessary replace programming unit
64	Emissions test mode	Internal fault	Check electronics board
65	Controlled operation	Internal fault	Check electronics board
66	Operation at constant temperature	Invalid hardware code	Check the control software circuit board and confirm the coding address: - Enter coding 2 (see page 101 for instructions). - Change code 8A to 176. - Confirm coding 92:160
67	Boiler controlled on basis of adjustable high limit	Internal fault Boiler coding card	Insert boiler coding card or replace if defective (see page 35)
68	Controlled operation	Open circuit Flue gas temperature sensor	Check flue gas temperature sensor (see page 45)
6F	Controlled operation	Incorrect LON communication module	Replace LON communication module
71	Boiler cools down	External safety equipment	■ Check connection of plug 150 ■ Check external safety equipment

Diagnosis *(continued)*

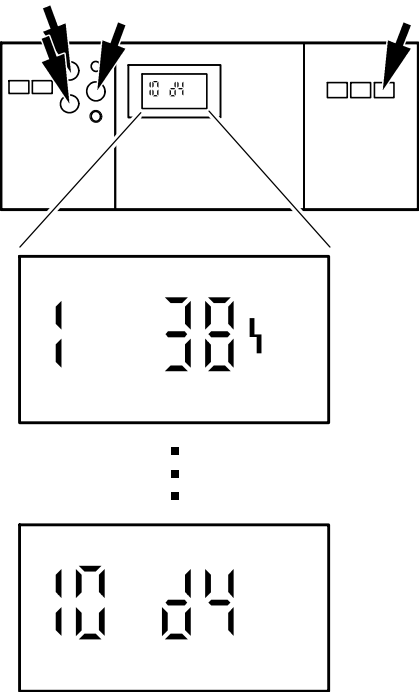
Faults with fault display on the programming unit *(continued)*

Fault code in display	Behaviour of system	Cause of fault	Action
E4	Control mode	Faulty communication with Input Module 0 to 10 V	Check connections and cables/leads; replace Input Module, if required (see page 110) Without Input Module: Set coding 9d: 0
E8	Boiler cools down	Error Low water indicator	Check water level of system, reset low water indicator
E9	Boiler cools down	Error Maximum pressure limiter	Check system pressure, reset maximum pressure limiter
Ea	Boiler cools down	Error Minimum pressure limiter or maximum pressure limiter 2	Check system pressure, reset minimum or maximum pressure limiter
Eb	Boiler cools down	Error Additional fixed high limit or limit thermostat or flue gas damper	Check system pressure, reset fixed high limit or flue gas damper
Ed	Controlled operation	Communication error Vitocom	Check connections and Vitocom
Ee	Controlled operation	Communication error Plug-in adaptor for external safety equipment	
Ef	Controlled operation	Error LON communication module	Replace communication module
d1	Boiler cools down	Burner fault	Check burner
d4	Boiler cools down	Fixed high limit has operated	Check fixed high limit reset to 25° C (+/- 5.0° C) Cooler than the high limit set
de	Controlled operation	Fault at "DE1" in the plug-in adaptor for external safety equipment	Check connection at inputs "DE1" to "DE3"
d7	Controlled operation	Fault at "DE2" in the plug-in adaptor for external safety equipment	
do	Controlled operation	Fault at "DE3" in the plug-in adaptor for external safety equipment	
EO	Controlled operation	Open circuit LON communication module	Check connection

Diagnosis (continued)

Retrieving fault codes from the fault memory (error history)

All faults which have occurred are stored and can be retrieved by scanning. The scanning sequence starts with the most recently stored fault code.

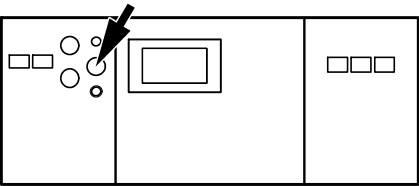


1. Press and simultaneously for approx. 2 seconds.

→ Scanning of error history is activated.
2. Access the individual fault codes by pressing the or button.

→ All stored fault codes can be deleted by pressing .

Sequence of stored fault codes	Fault code
{	Last (most recent) fault code
⋮	⋮
00	Last fault code



3. Press .

→ Scanning of error history is terminated.

Boiler Temperature Control

Brief description

The boiler water temperature is controlled by switching the burner on and off.

The set-point boiler water temperature value is determined by the set-point supply temperature values of the boiler circuit (A1), the heating circuits with mixing valve (from Vitotronic 050) and the set-point supply temperature value preset via coding address "9b" as well as the set-point domestic hot water temperature, and is dependent on the boiler and the heating and control facilities installed.

In conjunction with Therm-Control:

The set-point boiler water temperature is increased when the temperature falls below the set-point value on the sensor of the Therm-Control.

Coding addresses which influence the boiler temperature control
02 to 06, 08 to 0b, 13 to 1C.

Functions

The boiler water temperature is measured via a multiple sensor well by three sensors separately:

- Fixed high limit FHL (liquid expansion)
- Adjustable high limit AHL (liquid expansion)
- Boiler temperature sensor BTS (change in resistance PT 500)

Upper limits of control range

- Fixed high limit FHL
110°C / 230°F, can be adjusted to 100°C / 212 or 230°F
- Adjustable high limit AHL
95°C / 203°F, can be adjusted to 100°C / 212°F
- Electronic maximum limit
Setting range: 20 to 127°C / 68 to 261°F
The maximum limit for the boiler water temperature is defined in coding address "06".

Lower limit of control range

- The control unit regulates the boiler water temperature in normal operation and in the frost protection mode according to the boiler concerned (boiler coding card).

Control sequence

Boiler temperature falls

The burner override signal is set for a boiler water temperature setpoint value of -2°C / -4°F, and the burner starts its own monitoring program. Depending on the range of additional control facilities and the method of firing, burner override can be delayed by a few minutes.

Boiler temperature rises

The switch-off point of the burner is defined by the switch-off differential (coding address "13").

Heating Circuit Control

Brief description

The supply temperature of the boiler circuit (A1) corresponds to the boiler water temperature.

Coding addresses which influence the heating circuit control
55, 56, 58, 5A to 63, 6A, 6b.

Functions

The boiler circuit (A1) is dependent on the boiler water temperature and its control range limits.

Upper limit of control range
Electronic maximum limit
Setting range: 1 to 127°C / 34 to 261°F.
Change via coding address "C6".

Lower limit of control range
Electronic minimum limit
Setting range: 1 to 127°C / 34 to 261°F.
Change via coding address "C5".

Domestic hot water temperature

- With priority control:
While the DHW tank is being heated, the set-point supply temperature value is set to 0°C / 32°F.
- Without priority control:
The heating circuit control continues to operate as normal with the setpoint value unchanged.

DHW Tank Temperature Control

Brief description

The DHW tank temperature control is a constant value control. It operates on the basis of switching the DHW pump on and off.

The switching differential is $\pm 2.5^{\circ}\text{C}$ / 4.5°F .
During DHW tank heating, a constant maximum boiler water temperature is set (20°C / 36°F above the set-point DHW tank temperature, variable via

coding address "60") and space heating is switched off (DHW tank priority control optional).

Functions

Frost protection function

If the domestic hot water temperature falls below 10°C / 50°F , the domestic hot water DHW tank is heated to 20°C / 68°F .

Additional function for domestic hot water heating

For temporarily increasing the DHW tank temperature at selectable intervals → this provides additional assurance that bacteria are eliminated.
This function is activated when a second DHW setpoint value is selected via coding address "58" and a time is selected via coding address "63".

Heating with the additional function takes place daily at the time of the 1st domestic hot water heating period.

Set-point domestic hot water temperature

The set-point domestic hot water temperature can be set in the range of 10 to 60°C / 50 to 140°F . The setpoint range can be extended to 95°C / 203°F via coding address "56".

Additional control facilities

The domestic hot water supply can be blocked and released via change-over of the heating program.

System with DHW heating

The functions described above also apply in conjunction with DHW heatings.

Set the following codings:
"4C: 1", "4E: 1", "55: 3".

DHW Tank Temperature Control *(continued)*

Control sequence

DHW tank temperature falls

(Set-point value -2.5°C / -4.5°F , selectable via coding address "59")
The set-point boiler water temperature is set 20°C / 36°F higher than the DHW temperature set-point value (selectable via coding address "60").

The DHW pump is switched on immediately (Coding "61: 1").

Boiler temperature-dependent switching of the DHW pump
(Coding "61: 0"):

The circulation pump is switched on when the boiler water temperature is 7°C / 13°F higher than the domestic hot water temperature.

DHW tank temperature rises

(Set-point value $+2.5^{\circ}\text{C}$ / 4.5°F)
The boiler water temperature set-point value is reset to the value determined by the set-point supply temperature of the boiler circuit.

- When the DHW tank has been heated up, the DHW pump continues to run (coding "62: 10") until
 - the temperature difference between the boiler water and domestic hot water is less than 7°C / 13°F or
 - the set-point boiler water temperature selected through the set-point supply temperature of the boiler circuit is reached
 or
 - the set-point domestic hot water temperature is exceeded by 5°C / 9°F .
 The max. run-on time is 15 minutes (selectable via coding address "62").

- DHW pump without run-on time
(Coding "62: 00"):
The circulation pump is switched off immediately.

- With adaptive DHW tank heating
(Coding "55: 1"):
Adaptive DHW tank heating takes into account the rate at which the temperature increases during domestic hot water heating. It also takes into account whether the boiler must supply heat for space heating purposes after heating up the DHW tank or whether the residual heat of the boiler should be transferred to the DHW tank. The control unit determines the switch-off time of the burner and the circulation pump accordingly so that the set-point domestic hot water temperature is not substantially exceeded after DHW tank heating is completed.

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Technical Data

Rated voltage: 120 V ~
 Rated frequency: 60 Hz
 Rated actual: 2 x 6 A ~
 Power consumption: 10 W
 Protection class: I
 Degree of protection: IP 20 D to EN 60 529, to be guaranteed by mounting/integration

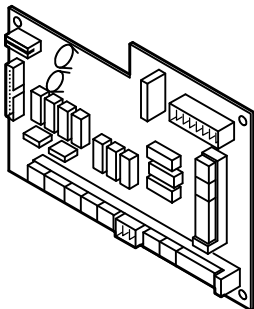
Ambient temperature
 ■ during operation: 0 to 40°C / 32 to 104°F
 For use in boiler rooms (normal ambient conditions)
 ■ during storage and transport: -20 to 65°C / -4 to 149°F

Relay outputs at 120 V ~ for
 ■ control output [20]: 2 FLA, 120 VAC*¹
 ■ circulation pump for heating the DHW tank [21]: 2 FLA, 120 VAC*¹
 ■ shunt pump or boiler circuit pump [29]: 2 FLA, 120 VAC*¹
 ■ central fault indicator [50]: 2 FLA, 120 VAC*¹
 ■ boiler isolation valve [52]: 0.1 FLA, 120 VAC*¹ or return valve 0.15 FLA, 24 VAC
 ■ burner connection [41]: 4 FLA 120 VAC
 connection [90]:
 – 2-stage: 0.5 FLA, 120 VAC
 – modulating: 0.1 FLA, 120 VAC

*¹ Total max. 6 A 120 VAC

System Components

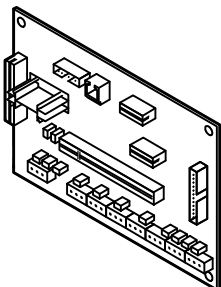
Line voltage motherboard, Part No. 7165 792



The motherboard contains:

- relays and outputs for activating the pumps, the control elements and the burner
- plug-in location for power supply unit board and boiler control section.

Low-voltage motherboard, Part No. 7820 290

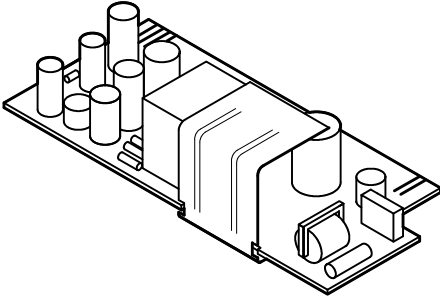


The motherboard contains:

- plugs for sensors, communication connections and external equipment
- plug-in locations for electronics board, LON communication module, Viessmann 2-wire BUS communication module, programming unit, boiler coding card and Optolink board.

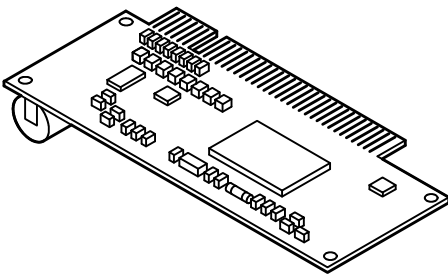
System Components *(continued)*

Power supply unit board, 120 VAC Part No. 7823 991



The power supply unit board contains the low-voltage supply for the entire electronics.

Electronics board, Part No. 7828 193

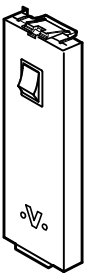


The board contains the microprocessor with the software.

When replacing the board:

1. Make a note of codings and settings on the control unit.
2. Replace the board.
3. Set coding "8A:176" and set coding address "92" (not listed in the overview) to "92:160".

Optolink/override switch board, Part No. 7820 165



The circuit board contains:

- Operating status indicator
- Fault indicator
- Optolink laptop interface
- Override switch

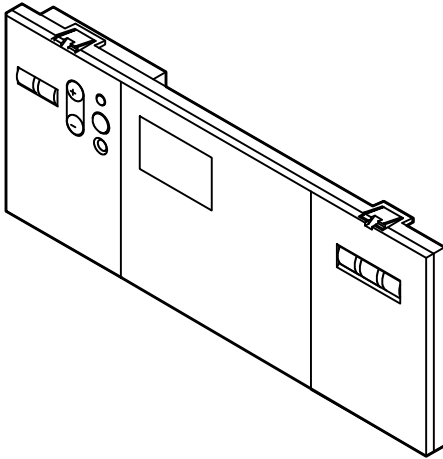
Override switch for flue gas measurements with the boiler operated with constant boiler water temperature for a short time.

The following functions are triggered in the "👉" setting:

- The burner is switched on (this can be delayed if the system incorporates a fuel preheater or flue gas damper)
- All pumps are switched on
- The boiler water temperature is controlled by the adjustable high limit "🕒".

System Components *(continued)*

Programming unit, Part No. 7823 990



The programming unit is inserted in the control unit.

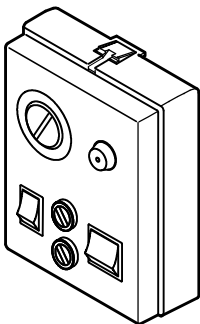
For setting:

- heating program
- set-point values

For displaying:

- temperatures
- operating status information
- faults

Fuse box, Part No. 7820 175

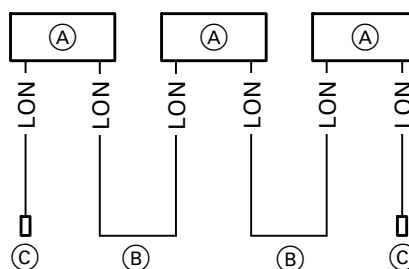
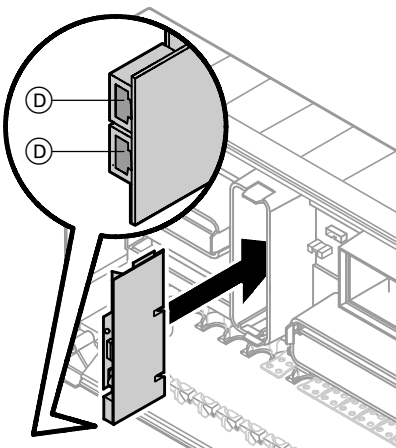


The fuse box contains:

- fixed high limit
- adjustable high limit
- fuses
- heating system switch
- TUV button

LON communication module, Part No. 7172 173

Accessory



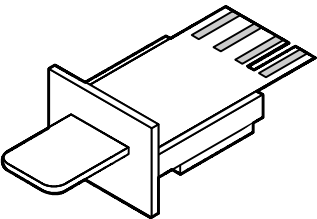
The communication module is inserted in the control unit. Interruption of communication is indicated.

1 terminal resistor is inserted on each of the first and last control unit.

- (A) Control unit or Vitocom
- (B) Connecting cable for data transfer between the control units (part of standard delivery or accessory)
- (C) Terminal resistor, (Part No. 7143 497, see Vitotronic 050 or Vitotronic 333)
- (D) Plug-in locations for (B) and (C)

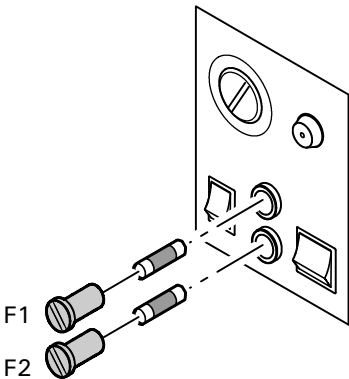
System Components *(continued)*

Boiler coding card



Vitotronic 200 in conjunction with	Boiler coding card	Part No.
Vitocrossal 300, Type CT3	1040	7820 144
Vitorond 200, Type VD2/VD2A	1020	7820 142
Vitocrossal 200, Type CM2	1041	7820 145

Fuses



F1: 6.3 A, 250 V for protecting the control elements, pumps and electronics.
Mounting location: see drawing.

F2: T6.3 A, 250 V for protecting the burner.
Mounting location: see drawing.

System Components *(continued)*

TUV button, Part No. 7819 314

*For checking the fixed high limit.
See description on page 86.*

Fixed high limit, Part No. 7820 036

- Type STW 56.10525.570, make: EGO, DIN STB (STW) 106095
or
EM-80-V-TK/b7-1 60002843, make: Juchheim, DIN STB 82699
- The fixed high limit has a factory setting of 120°C / 248°F.
- Electromechanical temperature switch based on the liquid expansion principle with interlock
- Intrinsically safe; interlocking also takes place if the capillary tube is leaking or if ambient temperatures are below -10°C / 14°F
- Limits the boiler water temperature to the maximum permissible value by cutting out and interlocking
- Can be adjusted with the slotted screw (A) at the rear of the unit to 110 and 99 °C / 230 and 210 °F (cannot be reset to 120°C / 248 °F once adjusted)
- Reset unit by pressing the reset button "↕" on the front of the programming unit if the temperature has fallen approx. 15 K below the shut down temperature
- Central fastening M 10, capillary 3600 mm long
- Tests:
Electrical to VDE 0701 standard
Functional check via TEST button

Adjustable high limit, Part No. 7817 531

- Type TR 55.18029.020, make: EGO, DIN TR 110397
or
EM-1-V-TK/b1 60002846, make: Juchheim, DIN TR 77798
- The adjustable high limit has a factory setting of 95°C / 203°F
- Electromechanical temperature switch based on the liquid expansion principle
- Controls the maximum boiler water temperature (e.g. in emissions test mode)
- Can be adjusted to 100 and 110°C / 212 and 230°F by altering the setting of the stop dial or by removing the cams

IMPORTANT

Set the lower limit at least 20°C / 36°F higher than the domestic hot water temperature, the upper limit at least 15°C / 27°F lower than the fixed high limit.

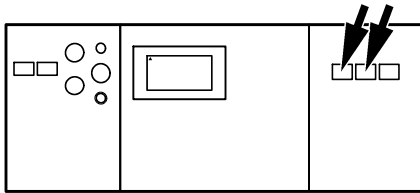
- Adjusting shaft 6 mm / 0.27 inches, flat topped
Adjusting knob pushed onto shaft from front
- Capillary 3600 mm / 141.7 inches long
Sensor 3 mm / 0.1 inches thick, 180 mm / 7.1 inches long
- Tests:
Electrical to VDE 0701 standard
Functional check via emissions test mode

Input Module 0 to 10 V, Part No. 7134 561

Resetting codings to the factory setting

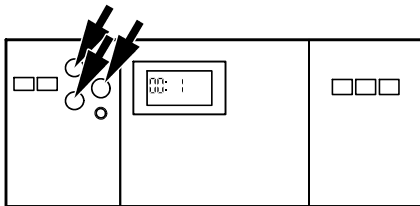
Coding 1

Call up coding level 1



1. Press and simultaneously for approx. 2 seconds.

→ Access coding level 1.
The first arrow appears in the display.



2. Call up the required coding address with the or button; press to confirm.

→ Address flashes.

→ Value flashes.

3. Change the value with the or button; press to confirm.

→ The value is stored and stops flashing for approx. 2 seconds. Then the address flashes and further addresses can now be selected with the or button.

4. Press and simultaneously for approx. 1 second.

→ Exit coding level 1.

Codings

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
00: 1	System type	System circuit A1 without domestic hot water heating	00: 2	System circuit A1 with domestic hot water heating
01: 1	System type	Single-boiler system	01: 2	Multi-boiler system with cascade control via LON BUS (e.g. Vitotronic 333, Type MW1)
			01: 3	Multi-boiler system with cascade control via switch contacts (input 143 and 146) or 0-10V input module
02: 1	Boiler/ burner	Operation with two-stage burner	02: 0	Operation with single-stage burner
			02: 2	Operation with modulating burner
03: 0	Boiler/ burner	Gas-fired operation	03: 1	Oil-fired operation (coding cannot be reset)
05: 70	Burner (mod.)	Burner curve	05: 0	Burner curve linear
			05: 1 to 05: 99	Burner curve not linear: Partial output in kW (at $\frac{1}{3}$ of the Operating time of the actuating drive) Max. output in kW $\times 100\%$ = Partial output in %
06: 87	Boiler/ burner	Max. limit of boiler water temperature set to 87°C / 189°F	06: 20 to 06:127	Maximum boiler water temperature limit variable between 20 and 127°C / 68°F and 261°F

Additional information

Coding 1 *(continued)*

Codings *(continued)*

Coding as per factory setting Address: Value	Function	New coding Address:Value	Possible change
07: 1	Boiler Boiler sequence number in multi-boiler system (in conjunction with coding address "01")	07: 2 to 07: 4	Boiler sequence number in multi-boiler system (in conjunction with coding address "01")
08:* ¹	Burner (mod.) Max. output of burner in kW	08: 0 to 08: 99	Maximum output variable from 0 to 99 kW; 1 increment = 1 kW
09:* ¹	Burner (mod.) Max. output of burner in kW	09: 0 bis 09:199	Maximum output variable from 0 to 19900 kW; 1 increment = 100 kW
0A:* ¹	Burner (mod.) Basic output of burner in %	0A: 0 to 0A:100	Basic output in kW $\frac{\text{Max. output in kW}}{\text{Max. output in kW}} \times 100\% =$ Basic output in %
15: 10* ²	Burner (mod.) Operating time of actuating drive	15: 5 to 15:199	Operating time variable from 5 to 199 seconds
40:125	General Operating time of actuating drive, boiler isolation valve, 3-port mixing valve or mixing valve motor in conjunction with return temperature control 125 minutes	40: 5 to 40:199	Operating time adjustable from 5 to 199
77: 1	General LON participant number	77: 2 to 77: 99	LON participant number selectable from 1 to 99 Please note: Each number may be assigned once only .

*¹ The factory setting is determined by the boiler coding card.

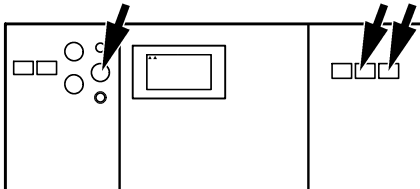
*² This setting is matched to the Vitocrossal.

Coding 2

Call up coding level 2

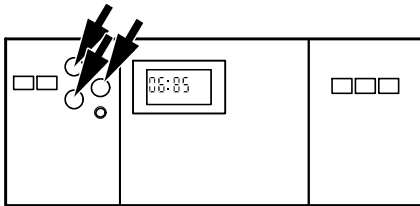
The overview lists all possible coding addresses.

However, only those coding addresses are displayed which correspond to the system type and equipment concerned and can be changed accordingly.



1. Press and simultaneously for approx. 2 seconds; press to confirm.

→ Access coding level 2.
The first two arrows appear in the display.



2. Select the required coding address with the or button; press to confirm.

→ Coding address flashes.

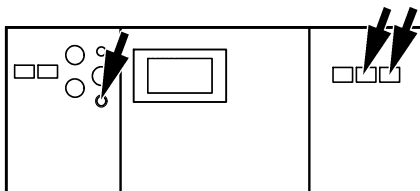
3. Change the value with the or button; press to confirm.

→ The value is stored and stops flashing for approx. 2 seconds. Then the address flashes and further addresses can now be selected with the or button.

4. Press and simultaneously for approx. 1 second.

→ Exit coding level 2.

Reset codings to factory settings



1. Press and simultaneously for approx. 2 seconds.

→ Access coding level 2.

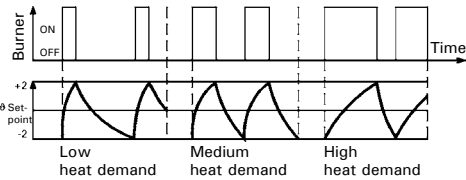
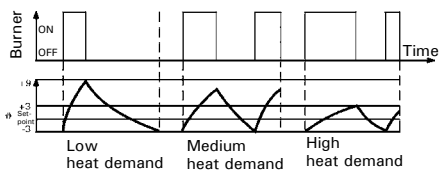
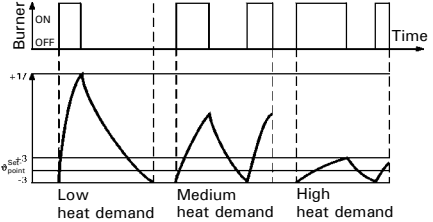
2. Press .

→ The codings are reset to their factory settings. The display changes and shows the boiler water temperature.

Overview of all codings

Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
00: 1	System type System circuit A1 without domestic hot water heating	00: 2	System circuit A1 with domestic hot water heating
01: 1	System type Single-boiler system	01:	Multi-boiler system with cascade control via LON BUS (e.g. Vitotcontrol-S, VD2/CT3, Model MW1)
		01: 3	Multi-boiler system with cascade control via switch contacts
02: 1	Boiler/ burner Operation with two-stage burner	02: 0	Operation with single-stage burner
		02: 2	Operation with modulating burner

Coding 2 *(continued)*Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
03: 0	Boiler/ burner Gas-fired operation	03: 1	Oil-fired operation (coding cannot be reset)
04: * ¹	Boiler/ burner Switching differential	04: 0	Switching differential 4°C / 7°F 
		04: 1	Switching differential heat demand-controlled ERB50 function Values from 6 to 12°C / 11 to 22°F are set, depending on the heat demand. 
		04: 2	ERB80 function Values from 6 to 20°C / 11 to 36°F are set, depending on the heat demand.  <p>The heat demand-controlled switching differential takes into account the boiler load. The switching differential, i.e. the burner operating time, is varied in relation to the actual heat demand.</p>
05: 70	Burner (mod.) Burner curve	05: 0	Burner curve linear
		05: 1 to 05: 99	Burner curve not linear $\frac{\text{Partial output in kW (at } \frac{1}{3} \text{ of the Operating time of the actuating drive)}}{\text{Max. output in kW}} \times 100 \% = \text{Partial output in } \%$

*¹ The factory setting is determined by the boiler coding card.

Coding 2 *((continued))*

Overview of all codings *((continued))*

Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
06: 87	Boiler/ burner Max. limit of boiler water temperature set to 87°C / 189°F	06: 20 to 06:127	Maximum boiler water temperature limit variable between 20 and 127
07: 1	Boiler Boiler sequence number in multi-boiler system (in conjunction with coding address "01")	07: 2 to 07: 4	Boiler sequence number in multi-boiler system (in conjunction with coding address "01")
08: * ¹	Burner (mod.) Max. output of burner in kW	08: 0 to 08: 99	Maximum output variable from 0 to 99 kW; 1 increment = 1 kW
09: * ¹	Burner (mod.) Max. output of burner in kW	09: 0 to 09:199	Maximum output variable from 0 to 19 900 kW; 1 increment = 100 kW
0A: * ¹	Burner (mod.) Basic output of burner in %	0A: 0 to 0A:100	$\frac{\text{Basic output in kW}}{\text{Max. output in kW}} \times 100\% = \text{Basic output in \%}$
0C: 5	Boiler Boiler isolation valve controlled on a modulating basis independently of the set-point boiler water temperature	0C: 0	Without function
		0C: 1	Continuous return temperature control
		0C: 2	Boiler isolation valve time-controlled
		0C: 3	Boiler isolation valve temperature-controlled
		0C: 4	Boiler isolation valve controlled on a modulating basis as a function of the set point boiler water temperature
0d: 2	Boiler With Therm-Control, effective for boiler isolation valve (function not active if "0C: 1" is coded)	0d: 0	Without Therm-Control
		0d: 1	With Therm-Control, effective for mixing valve of heating circuits connected downstream
13: * ¹	Boiler/ burner Switch-off differential in °C / °F The burner is switched off when the boiler water temperature rises above the set-point value	13: 0	Without switch-off differential
		13: 2 to 13: 20	Switch-off differential variable from 2 to 20°C / 4 to 36°F
14: * ¹	Burner Minimum operating time in minutes	14: 0 to 14: 15	Minimum operating time variable from 0 to 15 minutes
15: 10* ²	Boiler/ burner (mod.) Operating time of actuating drive 10 seconds	15: 5 to 15:199	Operating time variable from 5 to 199 seconds
16: * ¹	Burner (mod.) Mod. burner offset in °C / °F Temporary reduction of the boiler set-point value after burner start	16: 0 to 16: 15	Offset during optimized start-up adjustable from 0 to 15°C / 0 to 27°F
1A: * ¹	Burner (mod.) Optimized start-up in minutes	1A: 0 to 1A: 60	Duration of optimized start-up adjustable from 0 to 60 minutes

*¹ The factory setting is determined by the boiler coding card.

*² These settings are matched to the Vitocrossal.

Coding 2 *(continued)***Overview of all codings** *(continued)*


Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
1b: 60	Burner Time from ignition of burner to start of control 60 seconds	1b: 0 to 1b:199	Control delay adjustable from 0 to 199 seconds
1C:120	Burner Start delay 120 seconds (only selectable if no operating signal "B4" is available at plug [41] of the burner)	1C: 1 to 1C:199	Start delay adjustable from 1 to 199 seconds
1F: 0	Boiler No monitoring of flue gas temperature	1F: 1 to 1F: 50	With flue gas temperature sensor connected: When the flue gas temperature exceeds the preselected limit value (selectable in the range from 10 to 500°C / 50 to 932°F), the service display appears; 1 increment = 10°C / 50°F
21: 0	Boiler/ burner No service display for burner	21: 1 to 21:100	The number of burner hours run before the service display appears can be set between 100 and 10000 hours; 1 increment = 100 hours
23: 0	Boiler/ burner No time interval for burner maintenance	23: 1 to 23: 24	Time interval variable between 1 and 24 months
24: 0	Boiler/ burner No service display	24: 1	The service display appears (address is set automatically and must be reset manually after maintenance has been carried out)
26: 0	Boiler/ burner (2-stage) Fuel consumption of burner (1st stage); not metered if "26: 0" and "27: 0" are coded	26 : 1 to 26 : 99	Input from 0.1 to 9.9; 1 increment = 10 litres or gallons/hour
27: 0	Boiler/ burner (2-stage) Fuel consumption of burner (1st stage); not metered if "26: 0" and "27: 0" are coded	27: 1 to 27:199	Input from 10 to 1990; 1 increment = 10 litres or gallons/hour
28: 0	Boiler/ burner No intermittent ignition of burner	28: 1	The burner is automatically switched on for 30 seconds after 5 hours
29: 0	Boiler/ burner (2-stage) Fuel consumption of burner (2nd stage); not metered if "29: 0" and "2A: 0" are coded	29: 1 to 29: 99	Input from 0.1 to 9.9; 1 increment = 0.1 litre or gallon/hour
2A: 0	Boiler/ burner (2-stage) Fuel consumption of burner (2nd stage); not metered if "29: 0" and "2A: 0" are coded	2A: 1 to 2A:199	Input from 10 to 1990; 1 increment = 10 litres or gallons/hour
2b: 5	General Maximum preheating time of boiler isolation valve 5 minutes	2b: 0	No preheating time
		2b: 1 to 2b: 60	Preheating time selectable from 1 to 60 minutes

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
2C: 5	General Maximum run-on time of boiler isolation valve 5 minutes	2C: 0	No run-on time
		2C: 1 to 2C: 60	Run-on time adjustable from 1 to 60 minutes
2d: 0	Boiler Shunt pump ON only when requested	2d: 1	Shunt pump ON continuously
40:125	General Operating time of actuating drive, boiler isolation valve, 3-port mixing valve or mixing valve motor in conjunction with return temperature raising facility 125 seconds	40: 5 to 40:199	Operating time adjustable from 5 to 199 seconds
4A: 0	General Plug 17 A not installed	4A: 1	Plug 17 A installed (e.g. temperature sensor of Therm-Control); automatically recognized
4b: 0	General Plug 17 B not installed	4b: 1	Plug 17 B installed (e.g. temperature sensor T2); automatically recognized
4C: 2	General Connections at plug 20 A1: Therm-Control switch contact	4C: 1	Primary pump of DHW heating
		4C: 3	Circulation pump of flue gas/water heat exchanger
4d: 1	General Connections at plug 29 : Shunt pump	4d: 2	Boiler circuit pump
		4d: 3	Boiler circuit pump with boiler isolation valve function
4E: 0	General Connections at plug 52 : Boiler isolation valve or 3-port mixing valve for return temperature raising facility	4E: 1	3-port valve of DHW heating
4F: 5	General Shunt pump, boiler circuit pump or distributor pump with 5 minutes run-on time	4F: 0	No pump run-on
		4F: 1 to 4F: 60	Run-on time adjustable from 1 to 60 minutes
54: 0	General Without solar control unit	54: 1	With Vitosolic 100; will be recognised automatically
		54: 2	With Vitosolic 200; will be recognised automatically

Coding 2 *(continued)*Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
55: 0	DHW Tank heating, differential +/- 2.5°C / 4.5°F	55: 1	Adaptive tank heating active (takes into account the rate at which the tank temperature increases during domestic hot water heating)
		55: 2	Tank temperature control with 2 tank temperature sensors
		55: 3	DHW heating circuit temperature control (sensor 17B if used in conjunction with mixing valve and a plate heat exchanger)
56: 0	DHW Setting range of domestic hot water temperature 10 to 60°C / 50 to 140°F	56: 1	Setting range of domestic hot water temperature 10 to 95°C / 50 to 203°F IMPORTANT ■ <i>Observe max. DHW temperature</i> ■ <i>Adjust adjustable high limit "ⓘ"</i>
58: 0	DHW Without additional function for domestic hot water heating	58: 1 to 58: 95	Input of a 2nd set-point DHW temperature value; variable between 1 and 95°C / 34 and 203°F (note coding address "56"). ⚠ CAUTION ■ <i>Set the adjustable high limit "ⓘ" to a value which is at least 10°C/ 18°F higher than the maximum domestic hot water temperature (the temperature which is reached by activating the additional function)</i> ■ <i>The temperature set on the adjustable high limit "ⓘ" must not exceed the maximum permissible tank temperature</i> <i>See installation instructions for the DHW tank concerned</i> 
59: 0	DHW Tank heating: Switch-on point – 2.5°C / 4.5°F Switch-off point + 2.5°C / 4.5°F	59: 1 to 59: 10	Switch-on point variable between 1 and 10°C / 18°F below set point value
5A: 0	DHW Without function	5A: 1	Supply temperature request of DHW tank is the maximum value of the system
60: 20	DHW When domestic hot water is being heated, the boiler water temperature is a maximum of 20°C / 36°F higher than the set-point domestic hot water temperature	60: 10 to 60: 50	Differential between boiler water temperature and set-point DHW temperature adjustable between 10 and 50°C / 18 and 90°F
61: 1	DHW Circulation pump switches on immediately	61: 0	The circulation pump is switched on as a function of the boiler temperature

Coding 2 *(continued)*

Overview of all codings *(continued)*

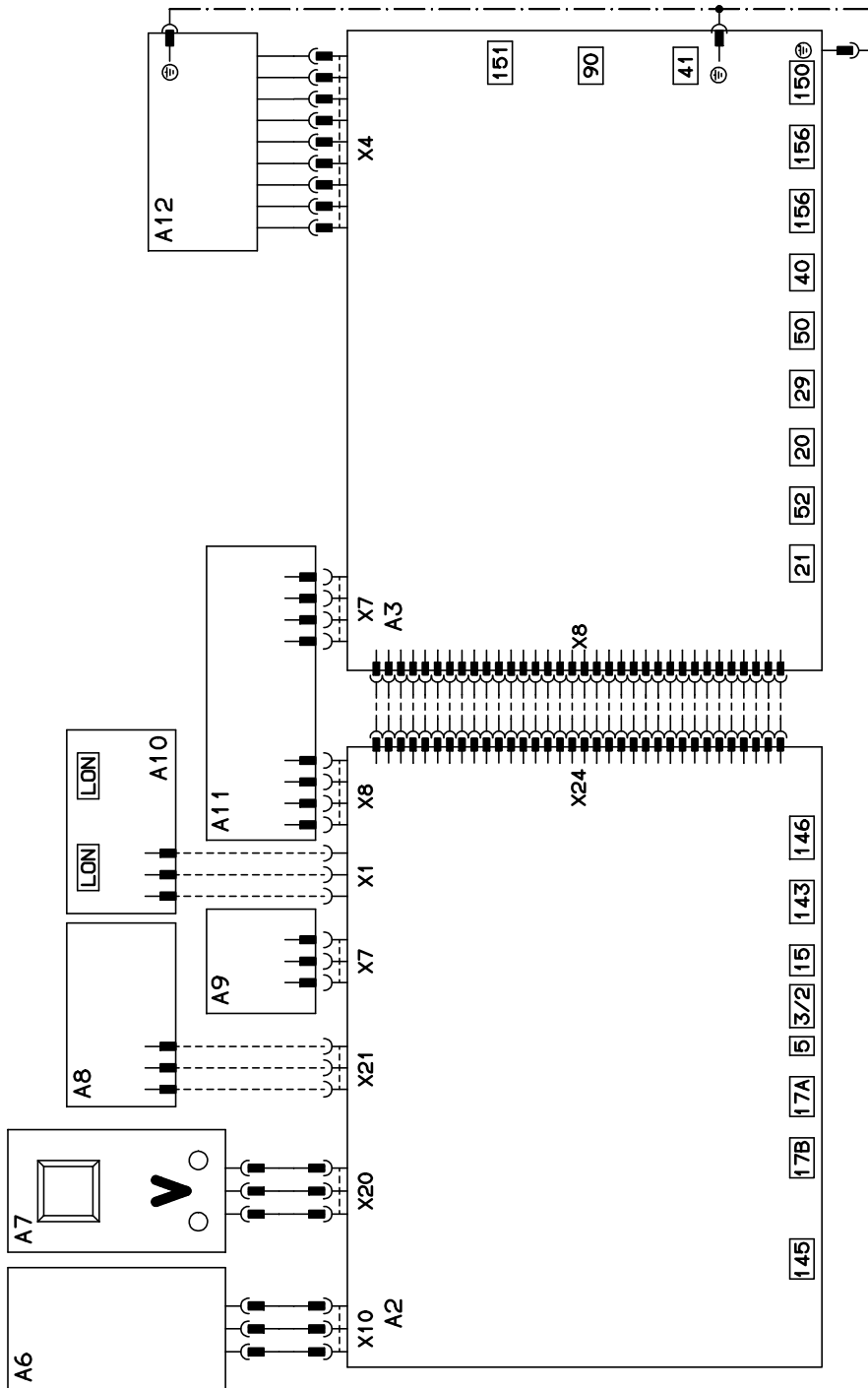
Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
62: 10	DHW Circulation pump with run-on time of 10 minutes	62: 0	Circulation pump without run-on time
		62: 1 to 62: 15	Run-on time variable from 1 to 15 minutes
67: 40	DHW With Vitosolic: 3rd DHW set-point 40°C / 104°F Reloading suppression will be active above set temperature. DHW tank is heated only by solar heating system.	67: 0	Without 3rd DHW set-point
		67: 1 to 67: 95	Input of a 3 rd set DHW set-point temperature; adjustable from 1 to 95°C / 34 to 203°F
63: 0	DHW Without additional function for domestic hot water heating	63: 15	Twice per day
63: 0	DHW Without additional function for domestic hot water heating	63: 1	Additional function: Once per day
		63: 2 to 63: 14	Every 2 days to Every 14 days
68: 8	DHW In conjunction with 2 tank temperature sensors with the DHW heating: Switch-off point of tank heating at setpoint value x 0.8	68: 2 to 68: 10	Factor adjustable from 0.2 to 1 per 1 increment = 0.1
69: 7	DHW In conjunction with 2 tank temperature sensors with the DHW heating: Switch-on point of tank heating at setpoint value x 0.7	69: 1 to 69: 9	Factor adjustable from 0.1 to 0.9 per 1 increment = 0.1
76: 0	General Without LON communication module	76: 1	With LON communication module; recognized immediately
		76: 2	With Viessmann 2-wire BUS communication module; recognized immediately
77: 1	General LON participant number	77: 2 to 77: 99	LON participant number selectable from 1 to 99 Please note: Each number may be assigned <i>once only</i> .
78: 1	General LON communication released	78: 0	LON communication blocked
79: 0	General Control unit is not error manager	79: 1	Control unit is error manager
80: 1	General With 5 seconds time delay for fault message	80: 0	Without time delay
		80: 2 to 80: 199	Time delay adjustable between 10 and 995 seconds; 1 increment = 5 seconds

Coding 2 *(continued)***Overview of all codings** *(continued)*

Coding as per factory setting Address: Value	Function	New coding Address: Value	Possible change
88: 0	General Temperatures displayed in Celsius	88: 1	Temperatures displayed in Fahrenheit
8A:175	General Display of codings which can be set for the system type concerned	8A:176	All codings displayed regardless of system type and equipment installed
92:165	General Do not Adjust! Is only displayed if 8A:176 is coded		
93: 0	General Central fault indication in emissions test mode/service display not effective for central fault	93: 1	Central fault indication in emissions test mode/service display effective for central fault
94: 0	General Without plug-in adaptor for external safety equipment	94: 2	With plug-in adaptor for external safety equipment; recognized automatically
98: 1	General Viessmann system number (in conjunction with monitoring of several systems within one LON BUS system)	98: 2 to 98: 5	System number selectable from 1 to 5
9b: 0	General Input 146 released	9b: 1 to 9b:127	Set-point supply temperature selectable via plug 146 from 1 to 127°C / 261°F with external request
9C: 20	General Monitoring of LON participants: If a participant does not answer back, default values set within the control unit are used for the first 20 minutes. Then an error message is transmitted.	9C: 0	No monitoring
		9C: 1 to 9C: 60	Time selectable from 1 to 60 minutes
9d: 0	General Without Input Module 0 to 10V	9d: 1	With Input Module 0 - 10V; will be recognized automatically

Wiring Diagrams

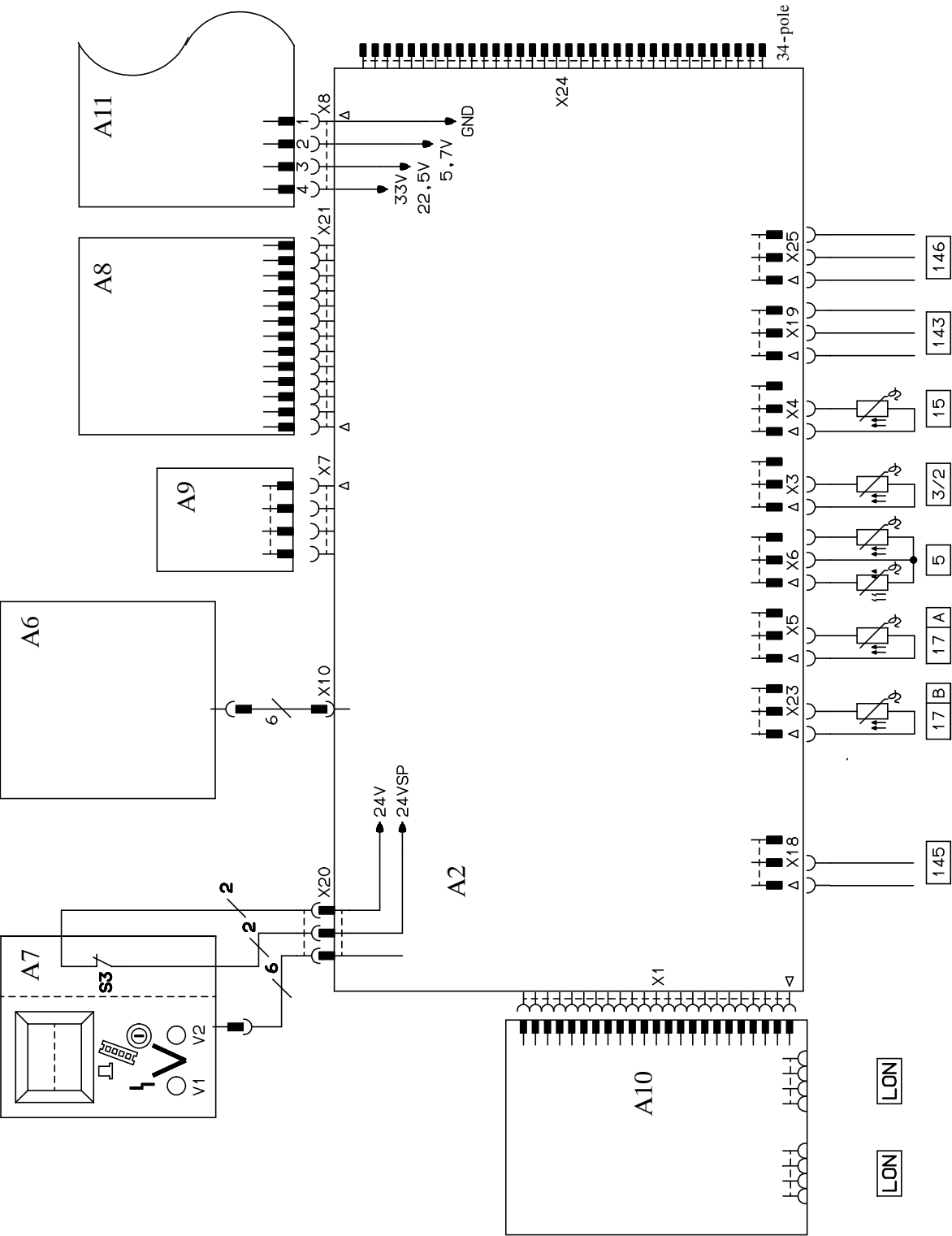
Overview




- A2 Low-voltage motherboard
- A3 Line voltage motherboard
- A6 Programming unit
- A7 Optolink/override switch board
- A8 Electronics board
- A9 Boiler coding card
- A10 LON communication module or Viessmann 2-wire BUS communication module
- A11 Power supply unit board
- A12 Boiler control section

Wiring Diagrams *(continued)*

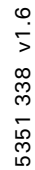
Low-voltage motherboard



Wiring Diagrams *(continued)***Low-voltage motherboard** *(continued)*

<div>3</div>	Boiler temperature sensor	<div>17</div> <div>A</div>	Temperature sensor T1	S3	Override switch "  "
<div>5</div>	Tank temperature sensor (accessory)	<div>17</div> <div>B</div>	Temperature sensor T2	V1	Fault indicator (red)
<div>15</div>	Flue gas temperature sensor (accessory)	<div>143</div>	Connection of external equipment	V2	Operating status indicator (green)
		<div>145</div>	KM BUS participant (accessory)		
		<div>146</div>	Connection of external equipment		
		LON	Connecting cable for data transfer between the control units		

Line voltage motherboard



Wiring Diagrams *(continued)*

Line voltage motherboard *(continued)*

20	Control output	90	Burner (2nd stage/modulating)	F1, F2	Fuses
21	DHW pump	150	External equipment	F6	Fixed high limit "⬆" / 120°C (99°C or 110°C) / 248°F (210°C or 230°F)
29	Shunt pump or boiler circuit pump	a	External safety equipment (remove jumper when connecting)	F7	adjustable high limit "⬆" / 95°C (100°C or 110°C) 203°F (212°F or 230°F)
40	Power supply connection, 120 VAC	b	External controlled switch-off (remove jumper when connecting)	K1-K10	Relay
41	Burner connection	c	External burner activation	S1	Heating system on/off switch "⬆"
50	Compiled failure alarm	151	Safety circuit - emergency shut-off	S2	TUV button
52	Boiler isolation valve or Boiler return valve	156	Power supply connection for accessories		

Parts List

GC1 Series

Order No.

7134 553, 7134 554, 7511 361

Serial No. *1

7143003□□□□□□□□

7187096□□□□□□□□

7248247□□□□□□□□

Ordering Replacement Parts:

Please provide product Model and Serial Number from rating plate when ordering replacement parts. Order replacement parts from your Viessmann distributor.

Parts

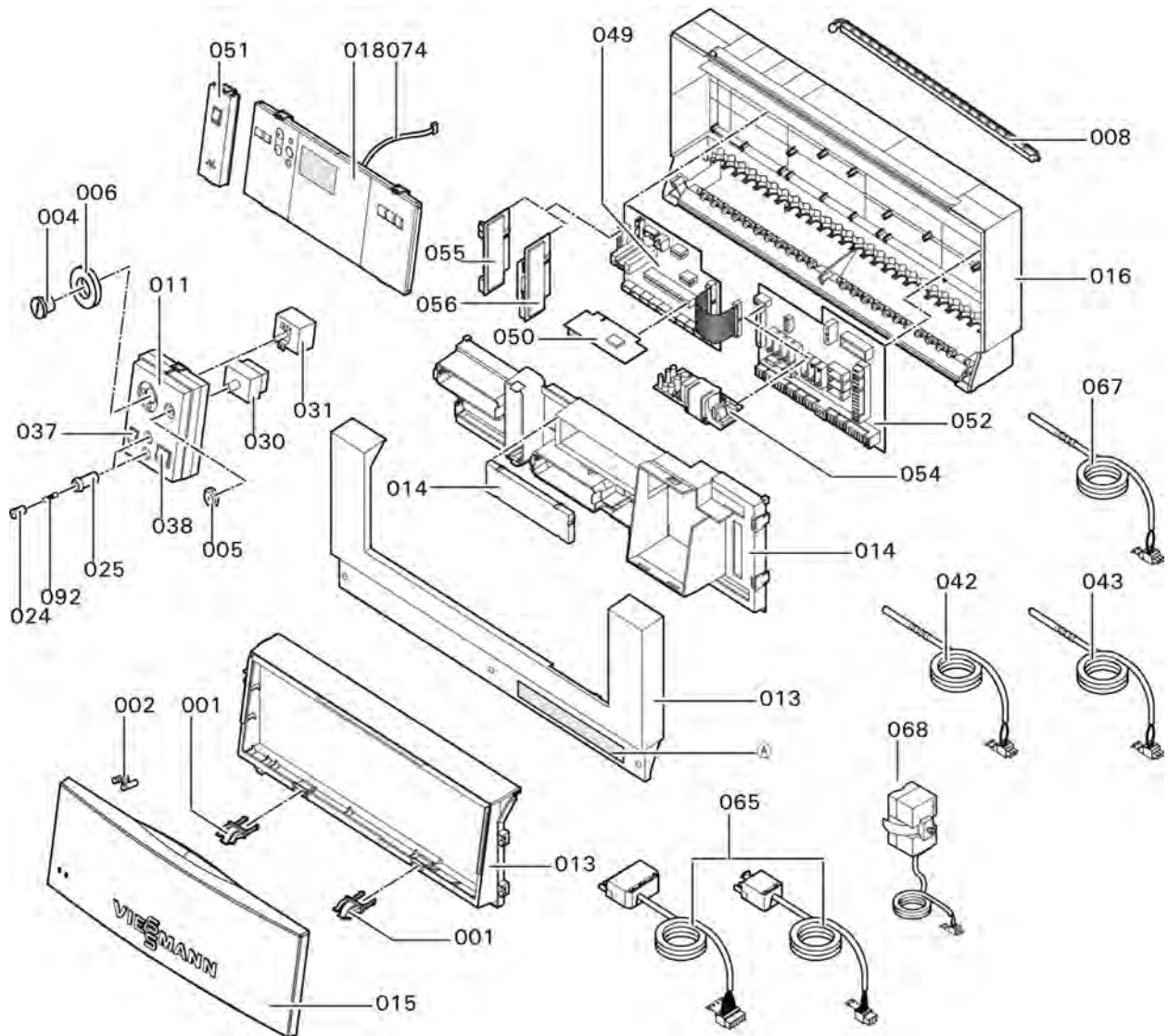
001	Hinges	050	Circuit board (control software)
002	Optic link	051	Diagnostics module (Optolink)
004	Adjustable high limit knob	052	Motherboard
005	Fixed high limit cover		(control, line voltage)
006	Dial-stop 110°C / 230°F	054	Circuit board
008	Support arm		(120V power supply)
011	Safety module (wired)	055	Communication module,
013	Front housing (with Pos. 001)		2-wire BUS
014	Circuit board enclosure	056	LON module
015	Flip-down cover	065	Burner cable Nr. 41/90 I=3470
016	Rear housing	067	Sensor (immersion, NI500)
018	Programming unit	068	Sensor #2 for supply
024	Fuse holder cover	074	Harness for programming unit
025	Fuse holder	092	Fuse 6.3A / 250V (10 pack)
030	Fixed high limit		
031	Adjustable high limit		
037	Switch, 1-pole (FHL test)		
038	Switch, 2-pole (power on/off)		
042	Sensor #3 for boiler		
043	Sensor #5 for domestic hot water production		
049	Motherboard		
	(control, low voltage)		

Other Parts (not illustrated)

060	Accessory pack (plugs)
080	Installation / Service Instructions Vitotronic 100, GC1
081	Operating Instructions Vitotronic 100, GC1
082	Parts List Vitotronic 100, GC1
Ⓐ	Rating plate

*1 *A 16-digit bar-coded serial no. is printed on the front housing, below the flip-down cover.*

Parts List





Quick Reference

°C	°F
-40	-40
-35	-31
-25	-13
-20	-4
-18	0
-16	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
0	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+86
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

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